Apalachicola Bay System Initiative Community Advisory Board

Phase IV - 2022
Workplan and Schedule

January 26, 2022

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ABSI COMMUNITY ADVISORY BOARD PROCESS TO DATE

- **PHASE I (2019). Standing up and Organization of the ABSI CAB**
  — Status Complete
  May 2019 – Dec. 2019 (Assessment, Questionnaire, & 2 CAB Meetings)

- **PHASE II (2020). Scoping of Issues, Identification of Performance Measures & Strategies** — Status Complete
  Jan. 2020 – Dec. 2020 (7 CAB Meeting & 1 Oystermen's Workshop)

- **PHASE III (2021). Building Consensus on CAB Recommendations for the ABS Ecosystem-Based Adaptive Management and Restoration Plan**
  — Adoption of Final Draft Management and Restoration Plan Framework for Phase IV Evaluation — Status Complete
  Jan. 2021 – Nov. 2021 (7 CAB Meeting & 2 Oystermen's Workshops)

ABSI CAB PHASE IV OVERVIEW

- **PHASE IV (2022). Evaluation of the Draft Adaptive Management and Restoration Plan Framework's Prioritized Restoration and Management Strategies, Restoration Projects Selection and Implementation, and Funding Planning** — Status Initiated
  Dec. 2021 – Dec. 2022 - (6 CAB Meetings, Public Workshops – TBD)

- **COMMUNITY ADVISORY BOARD (CAB).** CAB initiates Phase IV and works on evaluating the best combination of strategies that will achieve management and restoration objectives for the Bay using decision support tools coupled with available and emerging data and research. The CAB vets recommendations with management and restoration agencies. The CAB evaluates the priority and efficacy of strategies and actions and identifies specific recommended restoration projects and management approaches.

ABSI CAB Phase IV Overview

- **Public Engagement in 2022.** The CAB will initiate a community feedback initiative by soliciting and reviewing community input on the Plan Framework. The CAB will vet the results of their prioritized strategies with the larger ABS community through multiple formats including a questionnaire administered through a variety of methods including Facebook, online via the ABSI website, and direct mailings. In addition, public workshops will be held in-person and/or virtually depending on the COVID-19 pandemic status.
- **Restoration Funding Working Group (RFWG).** The Restoration Funding Working Group's role is to seek funding to implement the CAB's priority recommendations. The RFWG will be in place in early 2022.
- **CAB Successor Group.** The CAB Successor Group will be ready to convene when the CAB completes their work on the Apalachicola Bay System Ecosystem-Based Adaptive Management and Restoration Plan. The Successor Group's role will be to organize a group of key stakeholders committed to working collaboratively for the long-term, and once the CAB process is complete (~June 2024), to ensure that the Plan is implemented, monitored, and adaptively managed over time and has the support of the Community.

ABSI CAB Phase IV Schedule

- **Meeting I – January 26, 2022 (Virtual)**
  Review of Predictive Models
- **Meeting II – March 30, 2022 (ANERR or Virtual TBD)**
  Decision Support Tools Briefing; Discussion with FWC on Management Strategies
- **Meeting III - May 25, 2022 (ANERR or Virtual TBD)**
  Model Simulation Results & Strategies Refinements; Discussion with FDACS on Management
- **Meeting IV – July 27, 2022 (ANERR or Virtual TBD)**
  Model Simulation Results & Strategies Refinements; Discussion with FWC/DEP/ANERR on Restoration Strategies
- **Meeting V – September 28, 2022 (ANERR or Virtual TBD)**
  Model Simulation Results & Strategies Refinements; Discussion with Science Advisory Board on Restoration and Management Strategies
- **Meeting VI – November 30, 2022 (ANERR or Virtual TBD)**
  Model Simulation Results & Strategies Refinements

Scientists Working With Stakeholders to Build Consensus on Restoration and Management Approaches Using Collaborative Modeling

January 26, 2022

Jeff A. Blair

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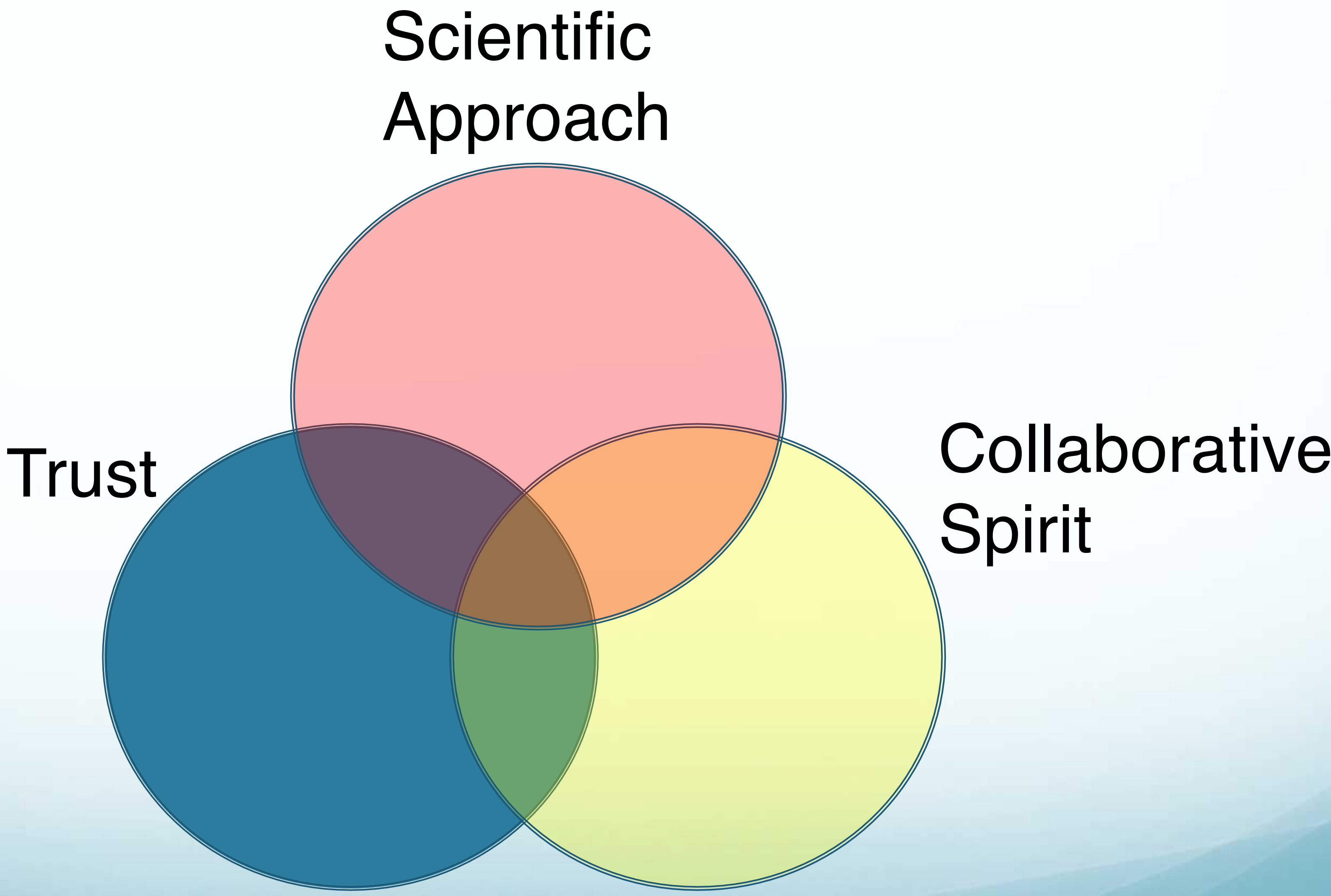
SUMMARY OF PRESENTATION

- What is Collaborative Modeling and why use it?
- Overview: Collaborating with Stakeholders in Modeling Initiatives
- Principles of Collaborative Modeling
- Stakeholder Centered Approach to Modeling
- Concerns and Responses in Involving Stakeholders in Modeling
- The Role of Scientists, Stakeholders and Facilitators in Collaborative Modeling
- Chesapeake TMDL Assessment Results – The Bay Model
- Case Study of Collaborative Modeling – OysterFutures
- Conclusions, Facilitator's Observations, and Draft Guidance

What Is and Why Use Collaborative Modeling?

- **Collaborative Modeling.** A Facilitated process to promote consensus decision-making with modeling to forecast potential effects of decisions.
- Combines good facilitation and conflict resolution practices with scientific modeling with the goal of making decisions or recommendations about management actions.
- Has been used since at least the 1970s to assist with decision making for natural resource issues.
- **Why Use Collaborative Modeling.** Natural resource management problems are messy.
- Many differing and often conflicting objectives.
- Uncertainty about potential consequences of actions.
- Leads to conflicts among and between user groups.

The Ingredients



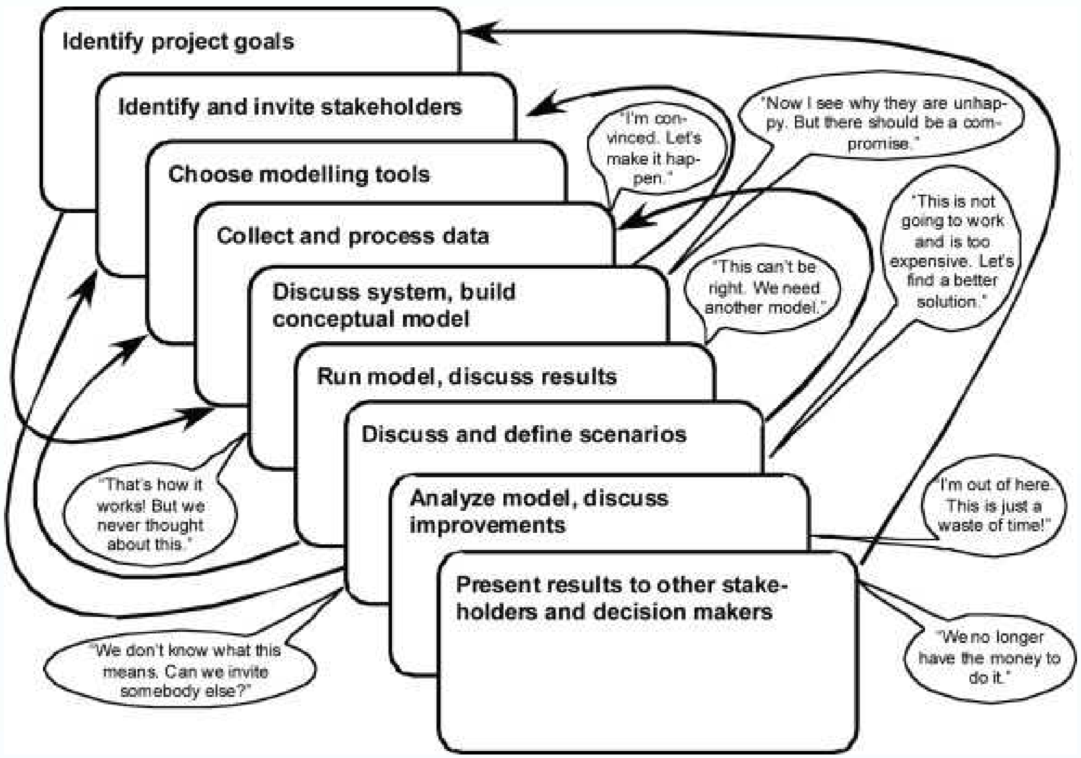
Principles of Collaborative Modeling

The Process, The People, and The Model

(The American Society of Civil Engineers' Environmental & Water Resources Institute)

1. Stakeholders are willing to work together.
2. All stakeholder representatives participate early and often.
3. Model & process remain accessible and transparent to all participants.
4. Builds trust and respect among parties.
5. Easily accommodating new information and quickly simulating alternatives.
6. Addresses questions that are important to all (decision makers & stakeholders).
7. Parties share interests and clarify the facts before negotiating alternatives.
8. Requires both modeling and facilitation skills.

DIFFERENT STAGES OF COLLABORATIVE MODELING



Different stages of a participatory (collaborative) modelling process. The back and forth loops are arbitrary and the stages are on cards to show that they can be shuffled at any moment. There is no particular order in how the process proceeds.

Alexey Voinov, Francois Bousquet

Modelling with stakeholders ☆

Environmental Modelling & Software, Volume 25, Issue 11, 2010, 1268–1281

http://dx.doi.org/10.1016/j.envsoft.2010.03.007

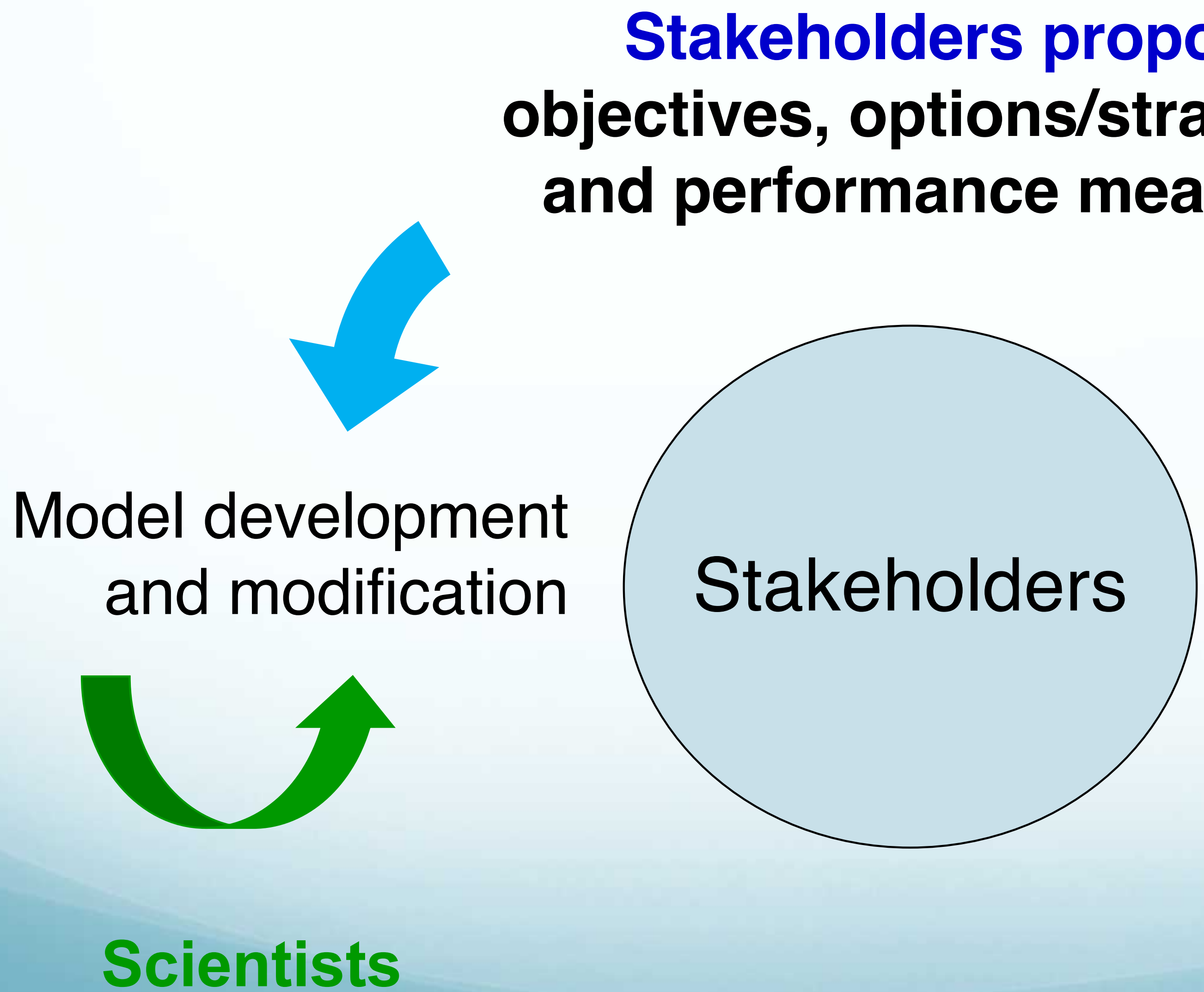
Collaborative Modeling Summary

- A major focus for modeling scientists is the challenge of increasing communication and transparency in the model development and application process through open source, community and participatory modeling.
- Collaborative modeling is an approach to develop robust and acceptable solutions to environmental and natural resource management problem.
- It involves a group of stakeholders, scientists, decision makers, and facilitators working together.
- Stakeholders bring information, experience, and knowledge to the table, as well as the legitimate concerns and perspectives of those who are most impacted by the implementation of policy decisions.
- When done well, it can provide solutions that can achieve the diversity of stakeholders' goals.

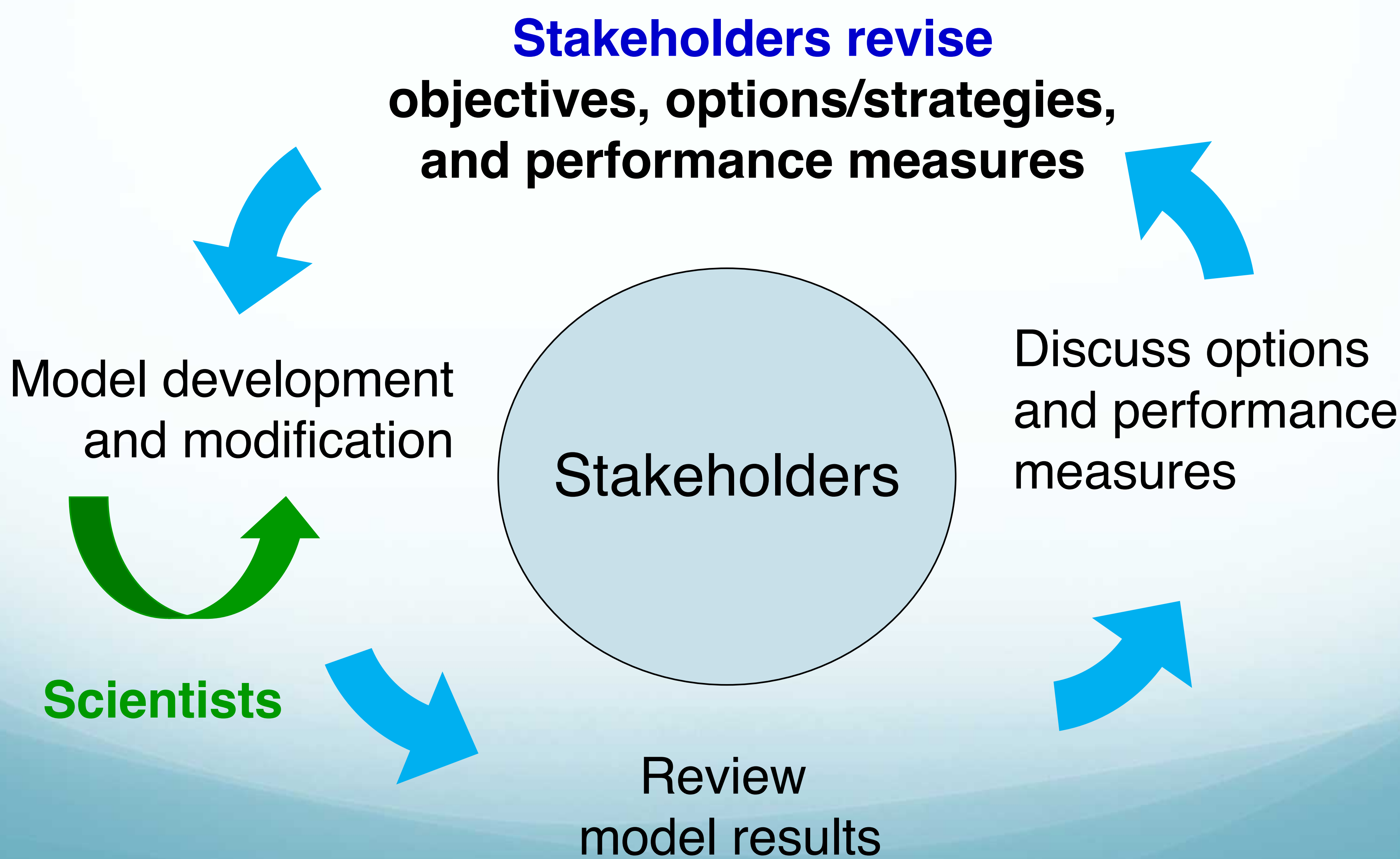
Stakeholder-Centered Approach To Collaborative Modeling?

Stakeholders propose
objectives, options/strategies, and performance measures

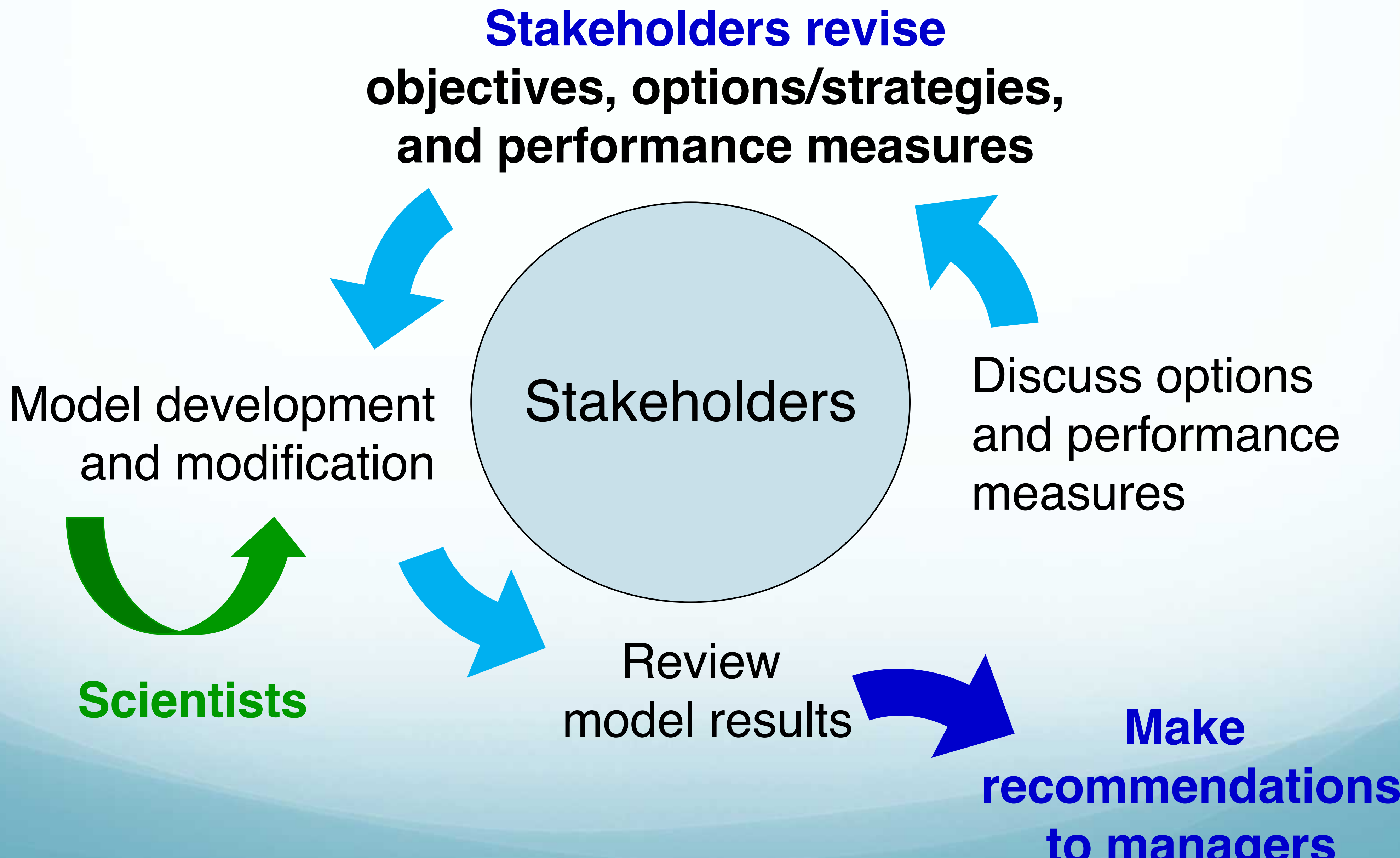
STAKEHOLDER-CENTERED APPROACH



STAKEHOLDER-CENTERED APPROACH



STAKEHOLDER-CENTERED APPROACH



CONCERNS WITH INVOLVING STAKEHOLDERS IN MODELING INITIATIVES

"What they are saying"

ADDRESSING THE CONCERNS

"It will take too long."

It will take longer to fight it out later with dissatisfied stakeholders.

"It will cost too much."

It will cost more in the long-term if stakeholders were not effectively engaged, don't support and actively advocate against the results.

"It will complicate the process."

Initially perhaps, but stakeholders who believe that their knowledge and experience are being respected and fairly considered will work collaboratively in a consensus process.

"Stakeholders will disagree with the data used in the model."

When data is presented transparently and accurately, acknowledges the assumptions, uncertainty and data gaps that exist, **and include stakeholders' experiences and observations,** then stakeholders are more likely to accept the data as the best available.

"We will never reach a consensus among the stakeholders involved."

Consensus-based processes have been demonstrated in many natural resource and environmental settings to build consensus with diverse stakeholder interests impacted by policy decisions.

Collaborative Modeling With Scientists and Stakeholders

- Presenting modeling results after planning and development **= Prescription for failure**.
- **Stakeholders should be invited and included at every stage** of the process including planning, design, development, implementation, and monitoring.
- **Best technical solutions vs. the "best" sustainable solutions.**
- **Solutions should incorporate an analysis of all of the considerations,** in consultation with impacted stakeholders: including the social, political, economic, financial, ecological, environmental and technical.
- **Transparency is critical and builds trust.** Be proactive about informing stakeholders of model assumptions, uncertainty, data sets used, and data gaps.
- **"Validate" model** to stakeholders by comparing results to stakeholders' experiences and observations.

Key Roles In A Science-Based Stakeholder Consensus Building Process

- Scientists
- Stakeholders
- Facilitators

The Importance and Role of Scientists Committed to Collaboration

- Understand the importance of meaningfully involving stakeholders.
- Are committed to the fair and effective involvement of impacted stakeholders.
- Respect and fairly evaluate and include observational data based on stakeholders' experiences in their data sets.
- Communicate to stakeholders in a respectful and collaborative manner.
- Are responsive to considering the experiences and observations of those who are most impacted by proposed solutions.

The Importance and Role of Stakeholders Committed to Collaboration

- Are willing to commit to the process for the duration, and honor consensus developed recommendations.
- Understand the need and are willing to collaborate with different stakeholder groups as well as communicate with their constituents.
- Listen to understand. Seek a shared understanding even if when they don't agree.
- Will work to achieve common ground on issues, and to address other stakeholder groups' concerns.
- Are committed to developing consensus recommendations that are sustainable and implementable within realistic constraints.

The Role of a Neutral in Facilitated Consensus-Building Stakeholder Processes

- **Include** professional and neutral process experts **in all phases**.
- **Consider an assessment phase** to determine viability and who should participate.
- Ensure there is appropriate and credible stakeholder **representation.**
- Plan & design a **transparent and fair process** that fosters collaboration.
- **Convene and facilitate** a fair and transparent representative stakeholder consensus-building process.
- **Recommend/Require a super-majority decision making threshold** for approval (≥75%) to encourage collaboration and not vote counting.

Chesapeake Bay Stakeholder Assessment
The Chesapeake Bay TMDL*

*Total Maximum Daily Load – EPA established maximum amount of pollutant allowed in a water body

Pitfalls for Failing to Effectively Consult and Collaborate with Stakeholders – Why to Use Collaborative Modeling

- The Institute for Environmental Negotiation, University of Virginia (IEN) was contracted by EPA to perform a Process Assessment.
- The Report issued December 2015 identified issues associated with:

  1.) Equity;
  2.) Communication;
  3.) Collaborative leadership;
  4.) Accountability for results;
  5.) Funding and other resources;
  6.) Cost-effectiveness;
  7.) Adaptability;
  8.) Schedule; and,
  9.) The Bay Model.

Chesapeake Bay Stakeholder Assessment
The Chesapeake Bay TMDL

General Findings

- Effective stakeholder groups are needed and must be utilized throughout the process.
- Enhanced communication between and involvement of all sectors is needed.
- *Stop calling this a "blueprint." A blueprint is a complete design that can be built as it is. The Chesapeake Bay TMDL is a plan, which can and must be adapted based both on what is learned about what works and what is affordable.*

Chesapeake Bay Stakeholder Assessment Regarding The Chesapeake Bay TMDL

The Bay Model Findings

- The Bay model does hold promise for providing a more accurate picture of the effectiveness of implementation efforts than monitoring alone, since some actions may take time to demonstrate improvements.
- Confusion over the role and validity of the model has been harmful.
- For some, there are too many assumptions that don't match realities.
- For others, the model is being asked to guide decisions at scales that are not suitable.
- For those for whom modeling is unfamiliar, hearing of results that don't match their experience de-legitimize the model and hence actions taken on the basis of the model.

COLLABORATIVE MODELING CASE STUDY

Oyster Futures

OYSTER FUTURES PROJECT: (2015 - 2019)

Integrating Stakeholder Objectives With Natural System Models to Promote Sustainable Natural Resource Policy (2015 – 2018)

Elizabeth North, Jeff Blair, Jeffrey Cornwell, Troy Hartley, Raleigh Hood,
Robert Jones, Thomas Miller, Lisa Wainger, Michael Wilberg

Integrating Stakeholder Objectives With Natural System Models

Project Goal:

To develop recommendations for oyster policies and management that meet the needs of industry, citizen, and government stakeholders in the Choptank and Little Choptank Rivers of the Chesapeake Bay.

Workgroup Process:

- Using similar facilitated representative stakeholder consensus building process as used with the ABSI Community Advisory Board, Pensacola Bay System Stakeholders Working Group, and Project FishSmart.
- Watermen, Aquaculture, Seafood Buyers, Environmental Citizen Groups, Recreational Fishing Groups, State Agency (MDNR), Oyster Recovery Partnership, and Federal Agency (NOAA).

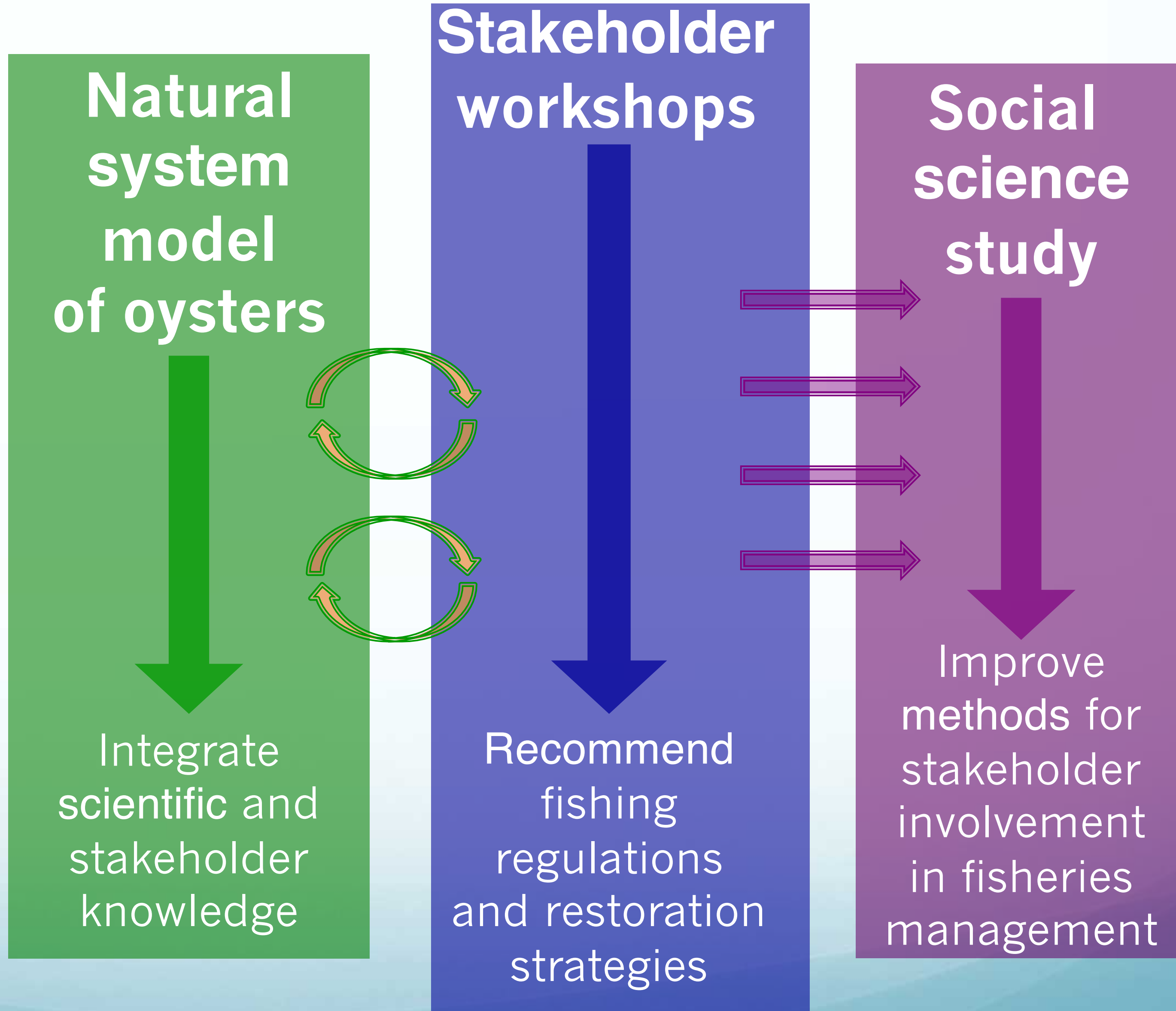
Oyster Futures

Integrating Stakeholder Objectives With Natural System Models

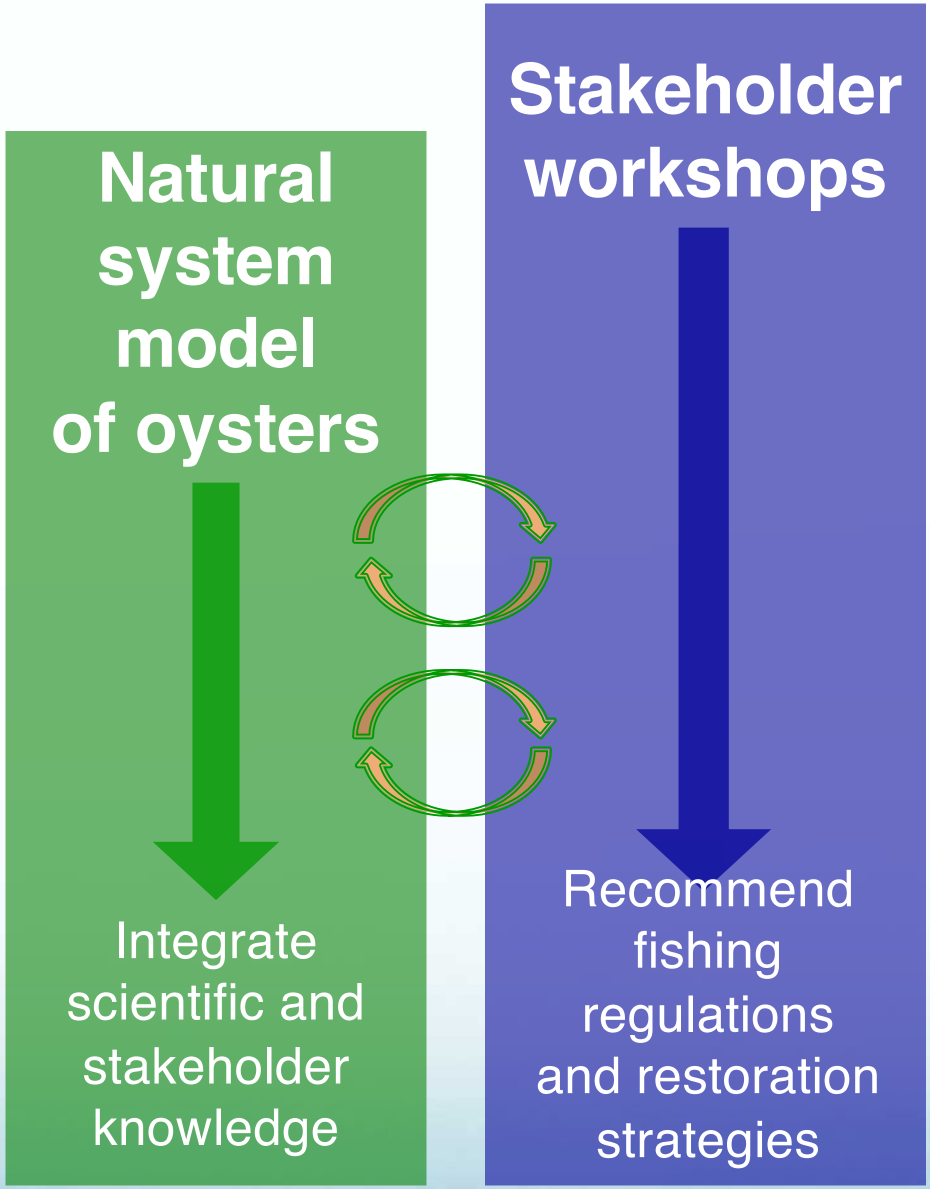
Project Premise:

- Natural resources can be better sustained by restoration and management policies developed cooperatively among affected stakeholders, scientists, and government representatives.
- A systematic approach for conducting collaborative policy development that is grounded in sound science is needed.
- We used the oyster fishery in Chesapeake Bay as a test case to study and to enhance this approach.

Oyster Futures



Oyster Futures



Scientists serve as consultants

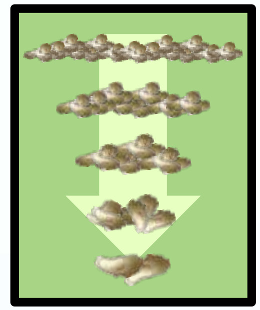
Oyster Futures

Couple multiple models in optimization framework that is spatially resolved

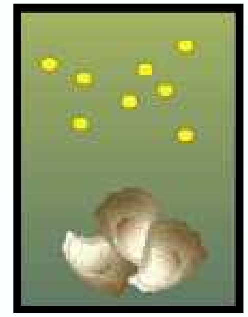
Natural system model of oysters

↓

Integrate scientific and stakeholder knowledge

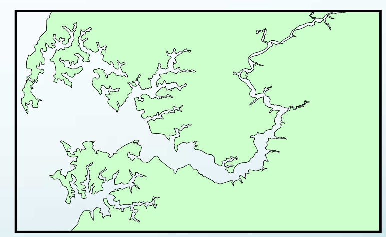


Population dynamics



Larval transport

Water quality



Hydrodynamic

Oyster Futures

Natural system model of oysters

Integrate scientific and stakeholder knowledge

In addition to **harvest,** the model could be used to evaluate changes in ecosystem services such as:

- **Seston reduction**
- **Light penetration**
- **Denitrification**
- **Trophic transfer**
- **Larval production**

Stakeholders decide on options and outcomes to be modeled

How did computer models support the process?

Options → **Computer Model** → **Outcomes**

- Changing or rotating fishing areas
- Planting shell, spat-on-shell, and reef balls
- Restoring reefs

Computer model includes scientific and stakeholder knowledge

Options → **Computer Model** → **Outcomes**

- Changing or rotating fishing areas
- Planting shell, spat-on-shell, and reef balls
- Restoring reefs

- Economics
- Oyster biology
- Oyster habitat
- Water quality

Computer model forecasts outcomes and stakeholders consider results

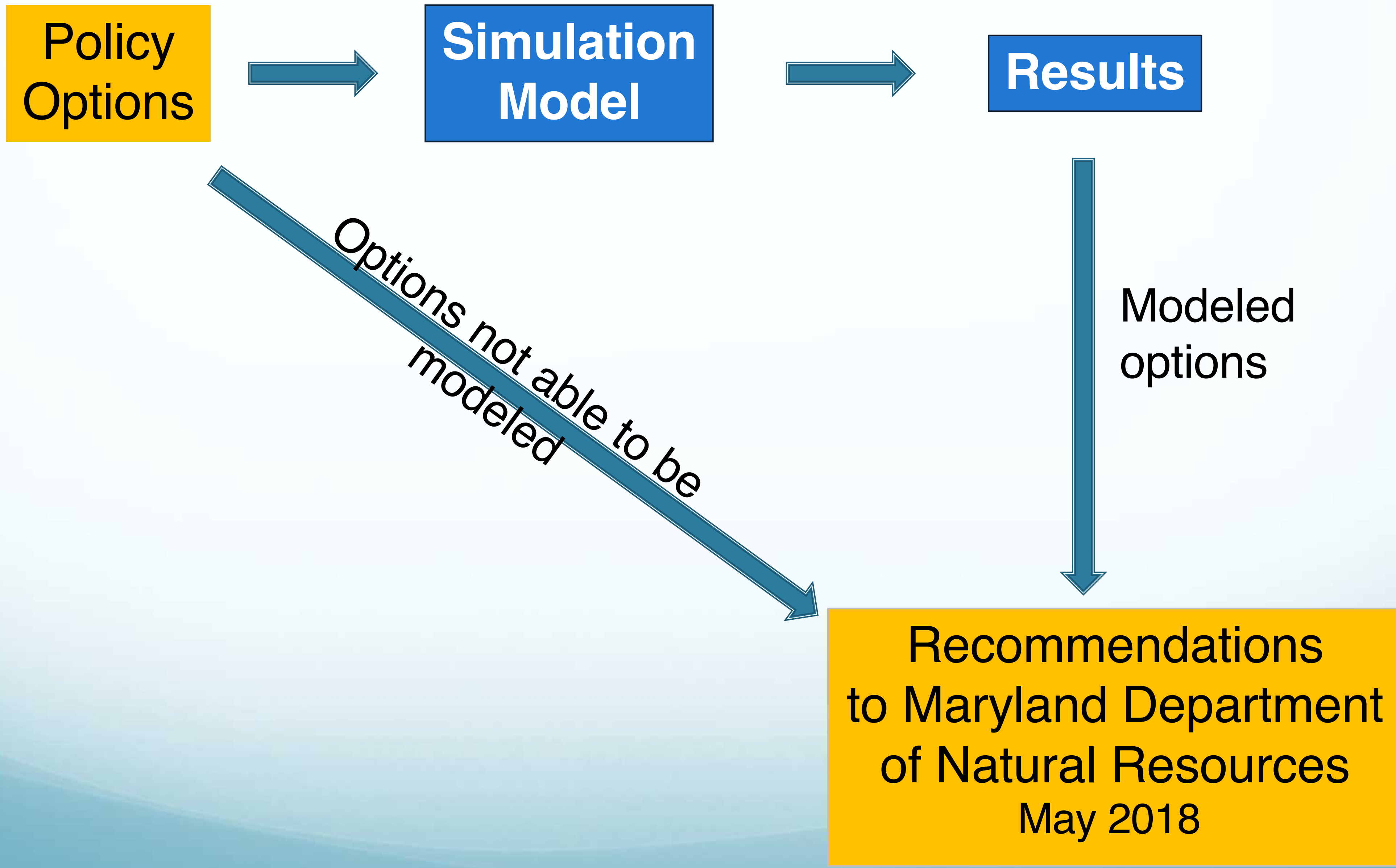
Options → **Computer Model** → **Outcomes**

- Changing or rotating fishing areas
- Planting shell, spat-on-shell, and reef balls
- Restoring reefs

- Economics
- Oyster biology
- Oyster habitat
- Water quality

- Oyster abundance
- Oyster habitat
- Harvest revenue
- Pollution reduction

Stakeholders make recommendations



Stakeholder Options That Were Evaluated

1. Rotational harvest
2. Enforcement
3. Use of assessment of population in management
4. Limited entry
5. Habitat modification/restoration
6. Fees and taxes
7. Spatial
8. Gear type
9. Stocking
10. Marketing and business practices

Performance Measures Evaluated in the Dashboard of the Mode

1. **Abundance (10,000s) Adults:** Total number of adults (one year old and older oysters) on October 1 across all the bars in System including sanctuaries and fishery areas.
2. **Habitat (1000 bushels):** Total amount of substrate over all bars in the System including shell, stone, and other materials.
3. **Harvest (1000 bushels):** Total harvest in 1000 bushels across all regions in the System and all gears. The total also includes undersized oysters and any harvest that occurs in sanctuaries.
4. **Fraction of Oysters Harvested:** Fraction of market-sized (>3 inch) oysters harvested. This fraction includes oysters that are in sanctuaries.
5. **Revenue ($1000):** Total dockside value of harvest across all regions in the System. Revenue is calculated as the harvest in bushels times the price per bushel. It does not include any additional multipliers for effects on the rest of the economy.
6. **Number of Licenses:** The total number of licensed operators harvesting oysters in the System.

Performance Measures Evaluated in the Dashboard of the Mode

7. **Water Clarity:** Percent increase in light available to seagrass at 2 m depth.
8. **Reef: N Removed:** Total pounds of nitrogen removed by oyster reefs in all regions of the System. This performance measure includes nitrogen that is converted from other sources into nitrogen gas.
9. **Catch: N Removed:** The total amount of nitrogen removed in the oyster meats from harvest.
10. **Social Value: N ($1000):** Value of nitrogen removed by reefs and harvest using a price of $834* per pound. **Note: this value will need to be calculated for the ABS working with the watermen.*
11. **Cost/Year ($1000):** Total cost of substrate and spat additions.
12. **Fishery Revenue – Cost (per year):** Revenue from harvest minus the cost of substrate and spat additions.
13. **Social Value N Removed + Revenue (fishery harvest) – Cost (restoration and management):** The social value of nitrogen removed plus the revenue (dockside value) of the harvest minus the cost of shell and spat on shell.

>100 options were evaluated

Performance improved over time

July 2017

OysterFutures Simulation Model
7/22/2017

YEAR 25
Performance Measures (difference from Status Quo)

Options	Abundance (1000s) Spat	2-3"	3-4"	4+"	Habitat (L/m2)	Harvest (1000 bu)	Revenue (1000 $)	Number Licenses	Seston (kg) Deposited	Nitrogen Removed
1. Status quo (SQ) - median of simulation results	347,962	297,704	334,796	200,442	57.8	106	3,775	495	84,718	94,417
2. Status quo (10% non-compliance with size regulation)	-3,496	-2,668	-2,878	-1,767	-0.1	0	7	3	-610	-656
3. All open to hand tong (other gears same as SQ)	-233,720	-169,661	-163,545	-94,818	-5.6	-72	-2,565	-263	-40,298	-45,577
4. All closed	231,348	130,646	181,007	122,449	4.1	-66	-2,338	-410	43,824	61,081
5. All closed with full compliance	297,740	163,742	232,334	155,176	5.1	-106	-3,775	-410	58,459	76,427
6. Lit Choptank and Tred Avon restoration (6 in substrate)	198,137	117,193	129,411	83,158	6.4	93	3,302	351	33,754	34,360
7. Lit Chop										
8. 3d artifi										
9. Restore										
10. SQ witl										
11. Low ha										
12. High h										
13. Slot siz										
14. Slot siz										
15. Slot siz										
16. Little C										
17. Little C										
18. 2 year										
19. 3 year										
20. 4 year										
21. 2 year										
22. 3 year										
23. 4 year										
24. 2 year										
25. 3 year										
26. 4 year										
27. Shell i										

January 2018

OysterFutures Model
Base Run - 1/3/2018

YEAR 22-25 (average)
Performance Measures (difference from Status Quo)

Options	Abundance (10,000s) Spat	Adults	Habitat (1000 bu)	Harvest (1000 bu)	Revenue (1000 $)	Number Licenses	Number Full Time	Seston Deposited	Water clarity	Reef: N removed	Catch: N removed	Social value N removed	Cost/yr (1000 $)	Revenue - Cost	Social N-Cost +Revenue
A. Status quo (SQ) (median)	35,658	94,419	11,478	161	$7,594	678	108	198,588		224,887	1,032	$188,416	$0	$7,594	$196,010
2. SQ, full compliance with size	298	624	12	-1	-$66	0	0	1,248		1,662	-6	$1,398	$0	-$66	$1,333
3. SQ, full compliance	3,141	6,927	106	-4	-$198	69	13	14,877		18,263	-23	$15,212	$0	-$198	$15,014
8. 2-yr Rotation (R), small, $2M – shell	3,449	2,106	3,698	3	$157	1	1	5,544		9,393	21	$7,851	$2,001	-$1,844	$6,007
9. 2-yr R, small, $2M – spat	6,345	3,593	438	21	$1,006	96	17	7,168		11,660	131	$9,834	$2,023	-$1,016	$8,818
10. 2-yr R, small, $600K – shell	2,321	406	1,017	-4	-$169	-14	-3	2,012		2,813	-23	$2,327	$544	-$714	$1,614
11. 2-yr R, small, $600K – spat															
12. 2-yr R, small, MidC, $2M – shell															
13. 2-yr R, small, MidC, $2M – spat															
13a. 2-yr R, small, MidC, $600K – spat															
14. 3-yr R, Little Choptank tribs – shell															
15a. 3-yr R, Little Choptank tribs – spat															
17a. Shell every yr in BC, $2M															
17a2. Shell every yr in BC, $600K															
18. Open LitChop tribs, shell every 3 yr															
19. LitChop & Tred restored (6" high)															
20. LitChop & Tred restored (12" high)															
23a. Reef balls in MidC SCA (1' apart)															
24a. Reef balls in MidC SCA (3' apart)															
26a. Spat every yr in MidC, $600K															
26b. Spat every yr in MidC, $2M															
B. All areas open to hand tonging															
C. All areas closed															
D. All areas closed, full compliance															
E. SQ, 10% size, 1% sanct harvest															
F. SQ, 0.5% sanctuary harvest															
G. SQ, 1.5% sanctuary harvest															
H. Restore all areas to 6"															
I. Full restoration over 25 yrs															
J. Implement a slot limit 3" – 5"															

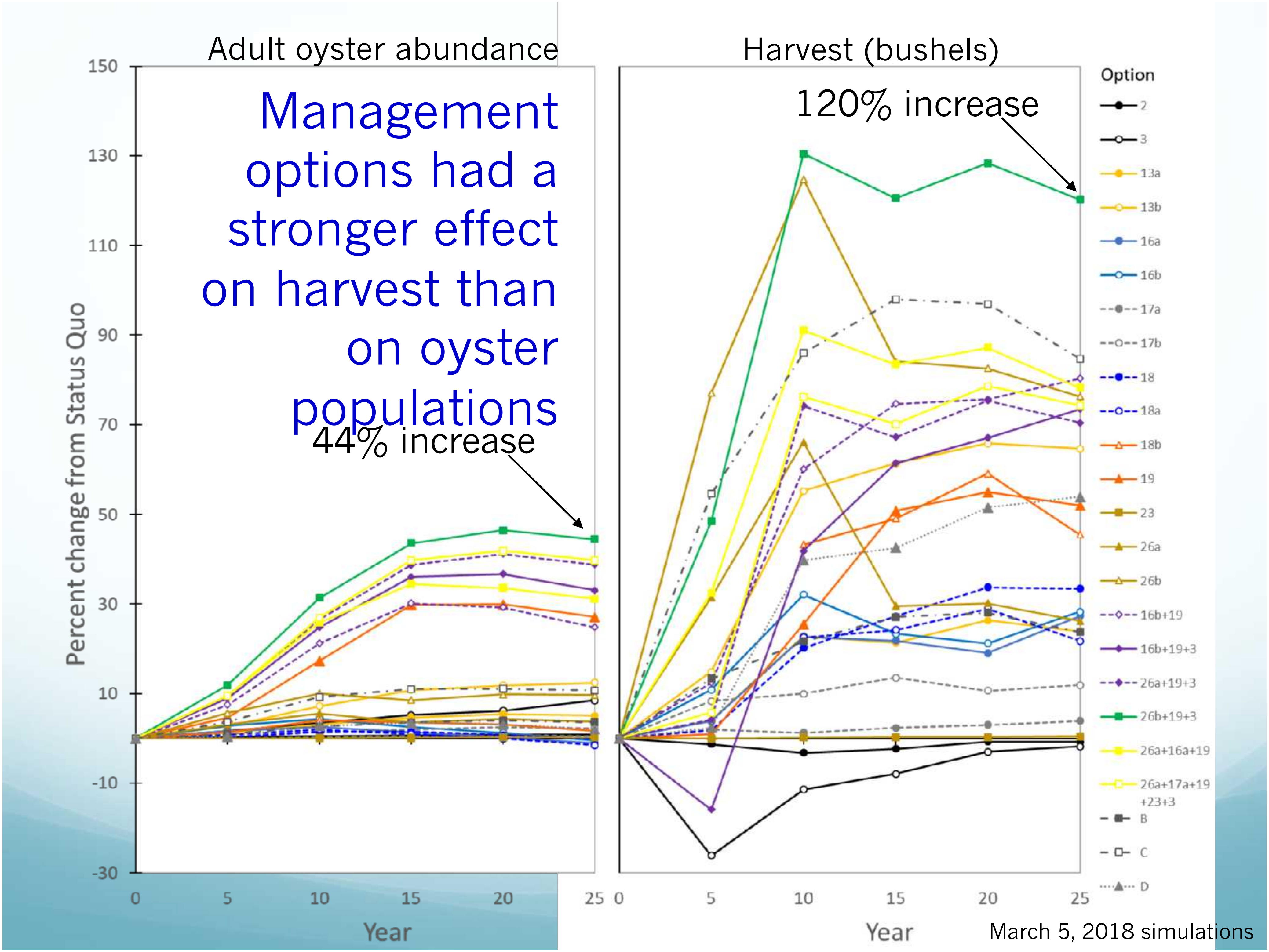
March 2018

OysterFutures Model
Base Run - 3/5/2018

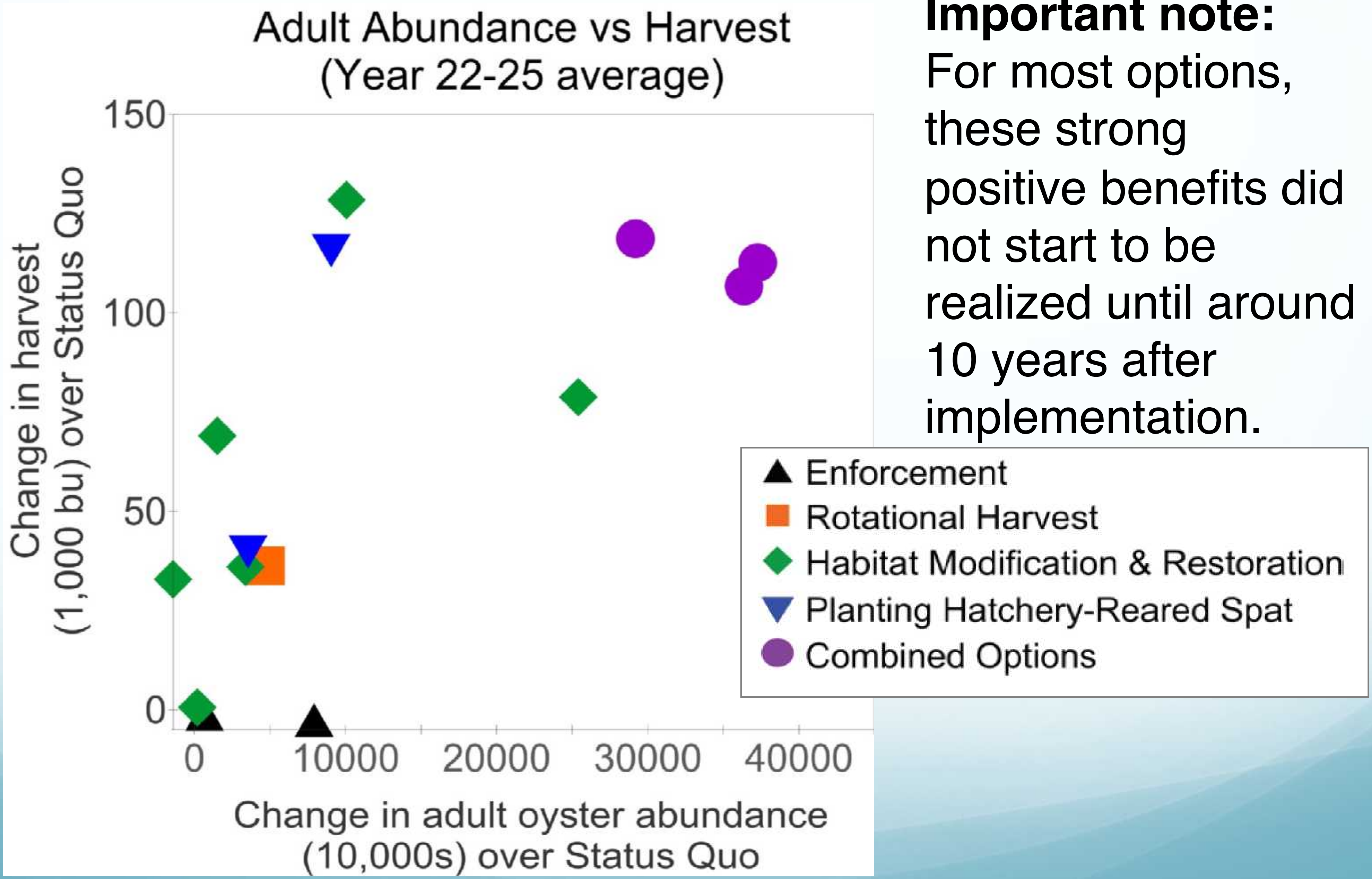
YEAR 22-25 (average)
Performance Measures (difference from Status Quo)

Options	Abundance (10,000s) Spat	Adults	Habitat (1000 bu)	Harvest (1000 bu)	Revenue (1000 $)	Number Licenses	Number Full Time	Seston Deposited	Water clarity	Reef: N removed	Catch: N removed	Social value N removed	Cost/yr (1000 $)	Revenue - Cost	Social N-Cost +Revenue
A. Status quo (SQ) (median)	39,643	93,792	11,347	152	$7,156	643	102	205,665		232,426	976	$194,657	$0	$7,156	$201,813
2. SQ, full compliance with size	286	686	11	-1	-$55	-3	0	1,403		1,522	-2	$1,268	$0	-$55	$1,213
3. SQ, full compliance	3,757	7,933	110	-3	-$126	71	13	15,677		19,554	-22	$16,289	$0	-$126	$16,163
13a. 2-yr R, MC sanc, $600K – spat	3,169	4,725	198	36	$1,713	152	27	11,385		10,892	226	$9,273	$603	$1,110	$10,382
13b. 2-yr R, MC sanc, $2M – spat	8,833	11,622	586	98	$4,625	406	73	23,596		27,066	624	$23,093	$2,001	$2,624	$25,718
16a. 2-yr R, LC tribs, $600K – spat	1,853	-900	119	41	$1,954	183	32	-1,335		-170	269	$83	$603	$1,352	$1,434
16b. 2-yr R, LC tribs, $2M – spat	4,369	-435	396	43	$2,024	187	34	-459		591	277	$724	$2,001	$23	$748
17a. Shell every yr in BC, $600K	295	427	1,109	6	$280	16	4	713		508	37	$454	$600	-$320	$135
17b. Shell every yr in BC, $2M	726	2,176	3,695	18	$850	84	15	4,105		2,150	111	$1,885	$1,999	-$1,149	$737
18. Open LC tribs, shell 3rd yr	-243	-55	865	51	$2,393	224	40	-1,508		-6,669	316	-$5,298	$424	$1,969	-$3,330
18a. Open LC tribs, spat 3rd yr, $600K	303	-1,403	115	33	$1,554	147	26	-3,504		-5,155	208	-$4,126	$556	$998	-$3,129
18b. Open LC tribs, spat 3rd yr, $2M	2,636	1,527	432	69	$3,256	302	53	1,110		-1,703	422	-$1,068	$1,847	$1,409	$341
19. Complete LC & TA restoration	16,719	25,399	626	79	$3,718	314	58	55,090		73,576	494	$61,774	$686	$3,033	$64,807
23. Reef balls in MC sanc	97	202	4	1	$29	2	0	460		512	4	$431	$63	-$34	$397
26a. Spat every yr in MC, $600K	2,931	3,565	182	40	$1,877	173	31	7,296		7,148	250	$6,170	$602	$1,275	$7,445
26b. Spat every yr in MC, $2M	7,341	9,047	546	116	$5,460	483	86	16,603		14,004	718	$12,278	$2,001	$3,459	$15,737
16b+19. 2-yr R LC, full restoration	20,104	23,259	981	122	$5,748	492	89	50,263		67,295	777	$56,772	$2,686	$3,061	$59,833
16b+19+3. 2-yr R LC, restore, complianc	29,769	31,006	1,093	111	$5,258	562	102	68,151		91,658	711	$77,036	$2,686	$2,572	$79,607
26a+19+3. Spat MC $600K, restore, com	22,918	36,365	925	107	$5,042	544	99	79,694		104,068	673	$87,354	$1,288	$3,754	$91,108
26b+19+3. Spat MC $2M, restore, comp	27,197	41,707	1,281	182	$8,606	852	153	87,840		110,057	1,144	$92,742	$2,686	$5,920	$98,662
26a+16a+19. Spat MC $600K, 2-yr R LC,	20,812	29,189	929	119	$5,603	480	88	62,059		83,217	750	$70,028	$1,890	$3,712	$73,741
26a+17a+19+23+3. Spat MC, Shell BC, re	29,287	37,283	2,034	113	$5,318	568	103	81,686		105,457	707	$88,541	$1,898	$3,420	$91,961
Sensitivity study – spat set 3.4x higher on clean shell															
B. Shell every yr in BC, $600K (#17a)	2,581	3,391	1,171	36	$1,699	163	29	5,354		3,984	231	$3,515	$600	$1,099	$4,614
C. Shell every yr in BC, $2M (#17b)	7,731	10,079	3,901	128	$6,065	574	102	16,342		10,899	801	$9,757	$1,999	$4,066	$13,824
D. Open LC tribs, shell 3rd yr (#18)	2,583	1,920	901	82	$3,856	360	64	1,158		-3,495	511	-$2,489	$424	$3,432	$944

Key: greater than 1 | less than -1 | (lbs) | (lbs) | (lbs) | (1000 $) | 25-yr ave | (1000 $) | (1000 $)

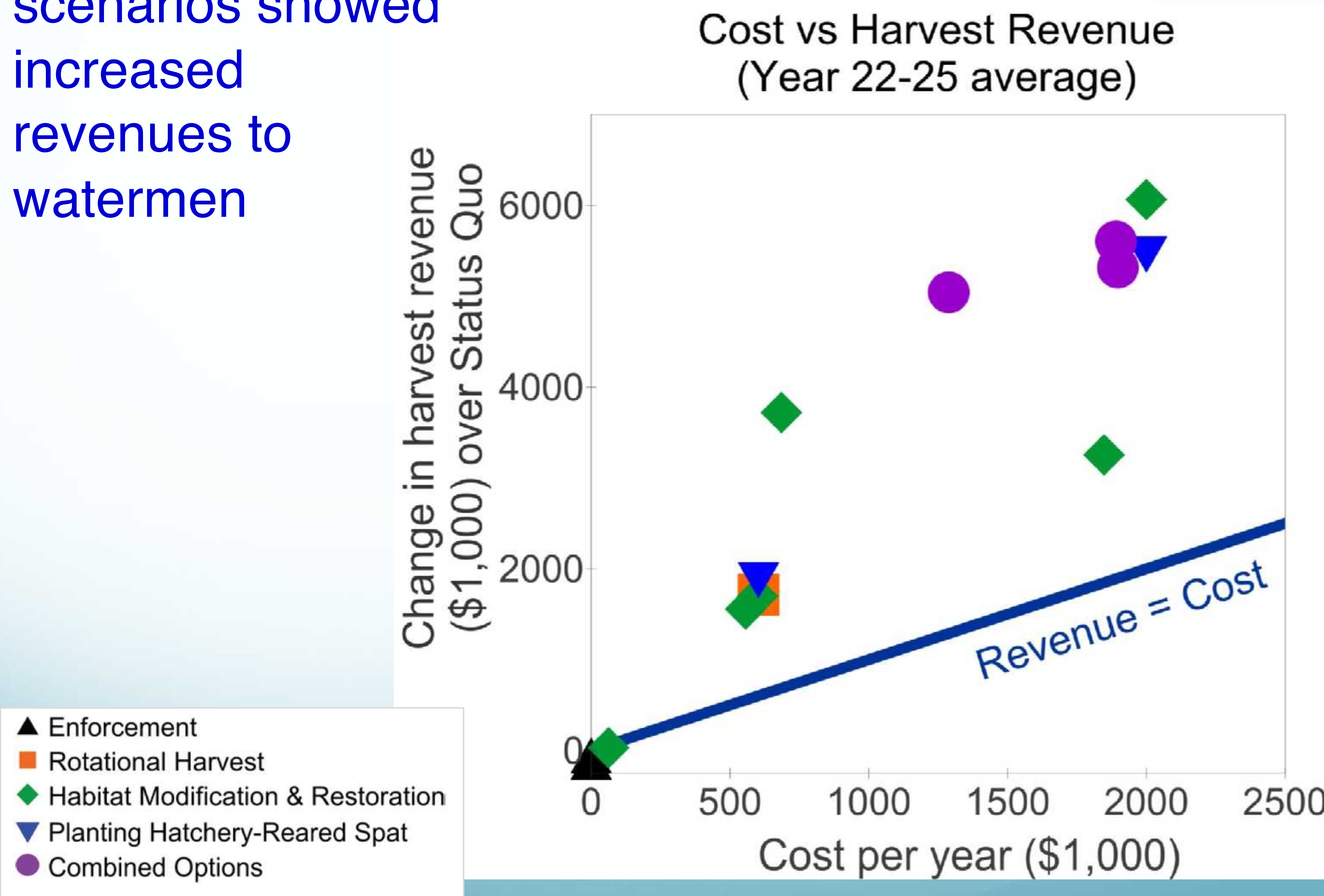

Management options had a stronger effect on harvest than on oyster populations
Adult oyster abundance
Harvest (bushels)
44% increase
120% increase
Percent change from Status Quo
150
130
110
90
70
50
30
10
-10
-30
0
5
10
15
20
25
Year
Option
2
3
13a
13b
16a
16b
17a
17b
18
18a
18b
19
23
26a
26b
16b+19
16b+19+3
26a+19+3
26b+19+3
26a+16a+19
26a+17a+19 +23+3
B
C
D
March 5, 2018 simulations

Win – win options exist: high abundances and high harvest

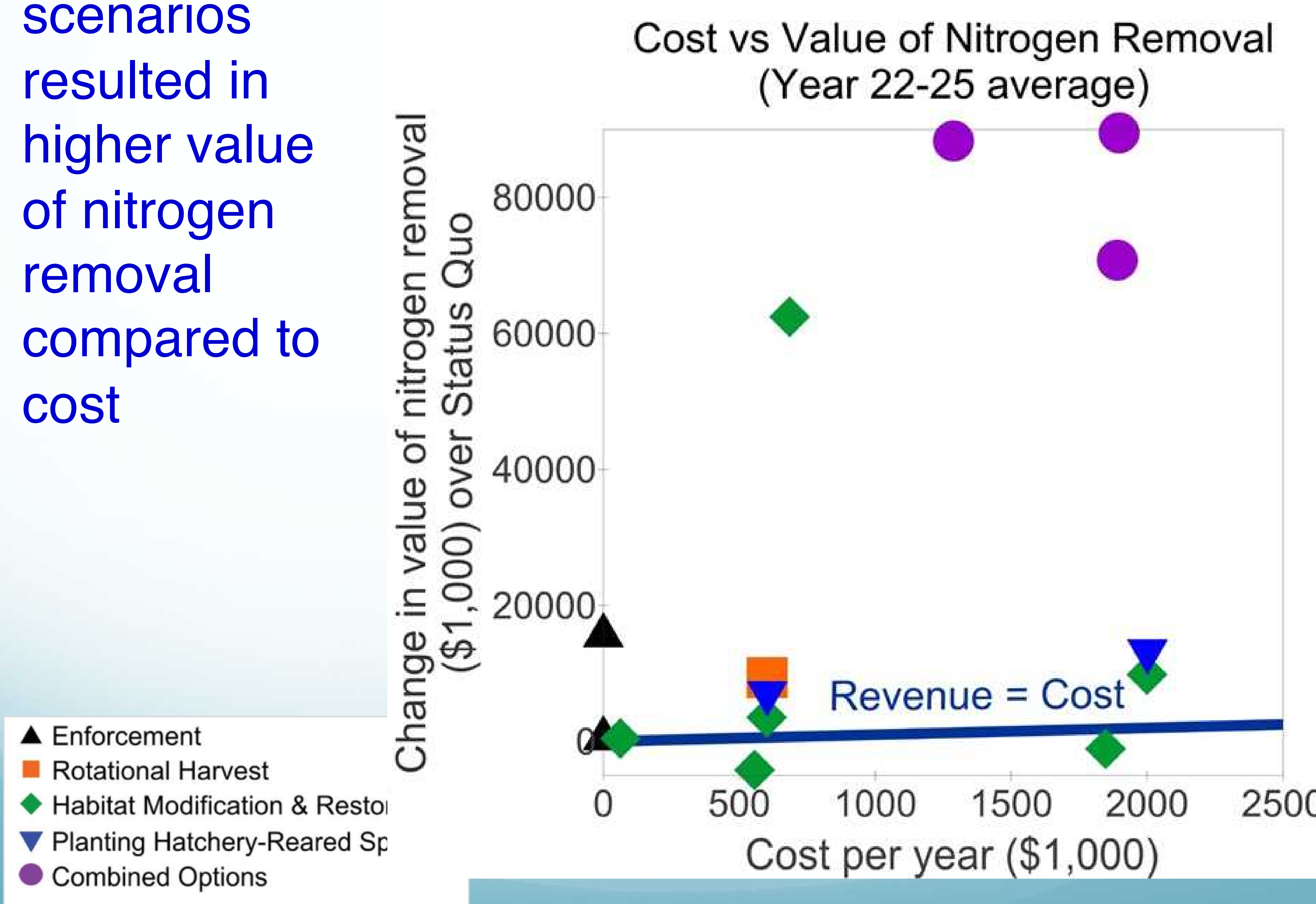


Important note: For most options, these strong positive benefits did not start to be realized until around 10 years after implementation.

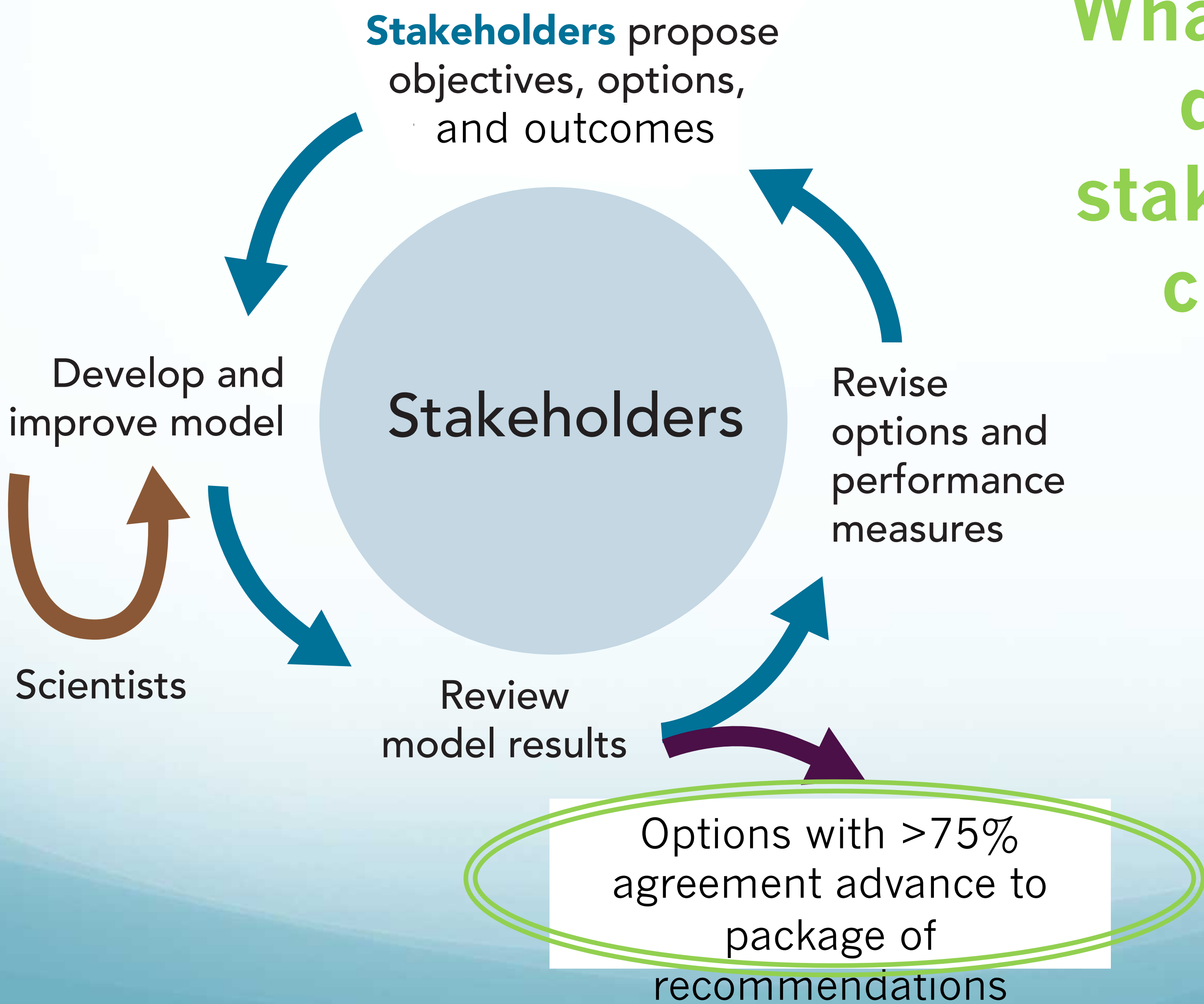
All but two scenarios showed increased revenues to watermen



All but two scenarios resulted in higher value of nitrogen removal compared to cost



Consensus Solutions process



What options did the stakeholders choose?

What Options the Stakeholders Choose

1. They chose options/strategies that increased oyster abundance and harvest.

2. They chose options/strategies that increased revenue to fisherman and were cost effective.

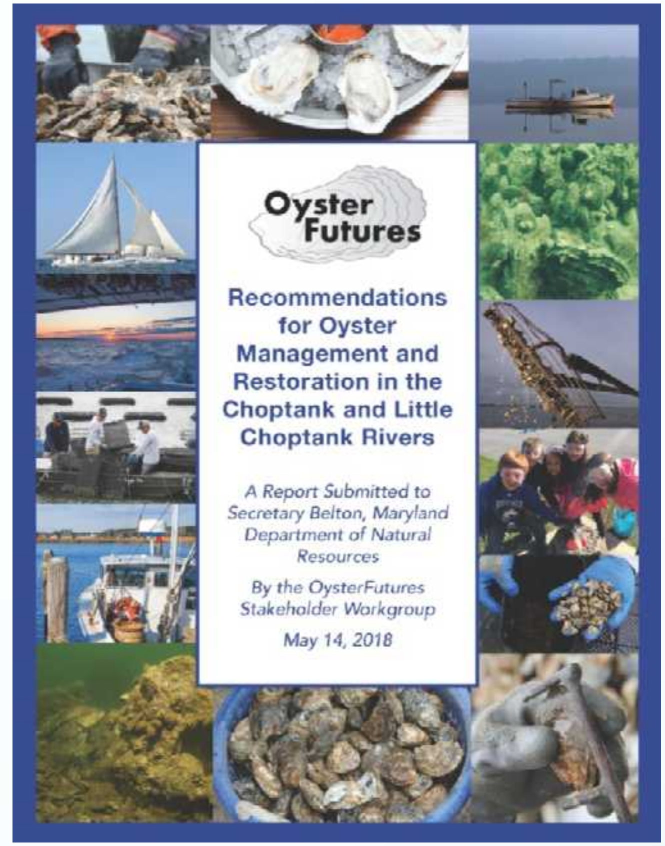
3. They chose options/strategies that increased nitrogen reduction and were cost effective.

TAKE HOME POINTS FROM MODEL FORECASTS

- Win-win-win options exist
- Strong positive benefits were not realized for 10 years
- Combining options led to best overall performance
- After 20 years, harvest revenue could be twice that of annual public investments
- After 20 years, there could be more than an 8-fold return on public investment for pollution reduction
- Choice of options had a stronger control on harvest than on oysters

Conclusions

- Consensus is possible
- Process is important - it can create or alleviate conflict
- The *Consensus Solutions* process helped create well-thought-out regulations with broad stakeholder support
- Win-win-win solutions for the oyster, the industry, and the environment can be found



Oyster Futures

Oyster Futures

Conclusions

- Scientific and local knowledge can be integrated and put in service of consensus.
- The *Consensus* process can help transform relationships and reframe conflict and produce “win-win" solutions.

Facilitators' Observations – Stakeholders

- Initially stakeholders expressed skepticism for the process.
- Historic deep-seated distrust/disagreement between stakeholders.
- Waterman felt sanctuaries were established without their input.
- Mistakes in citing could have been avoided with their input.
- After first meeting stakeholders indicated they were impressed with process and the respectful discussions with real listening, unlike in past.
- Working level of trust established after second meeting.
- Throughout the process their was some skepticism for the model results.
- Stakeholders remained optimistic and continued to collaborate on solutions despite obstacles.
- Stakeholders were able to discuss model results and tweak inputs so results more closely aligned with experience and observations.
- Stakeholders achieved unanimous consensus due to working collaboratively and not solely for their own interests.

COLLABORATIVE MODELING – DRAFT GUIDANCE

Conducting the Collaborative Modeling & Consensus Building Process

1. Establish consensus ground rules that include a super-majority threshold for the final consensus recommendations (≥75%) guidelines for participation of stakeholders and researchers.

2. Establish a shared vision and related goals to serve as a framework for stakeholders to identify options.

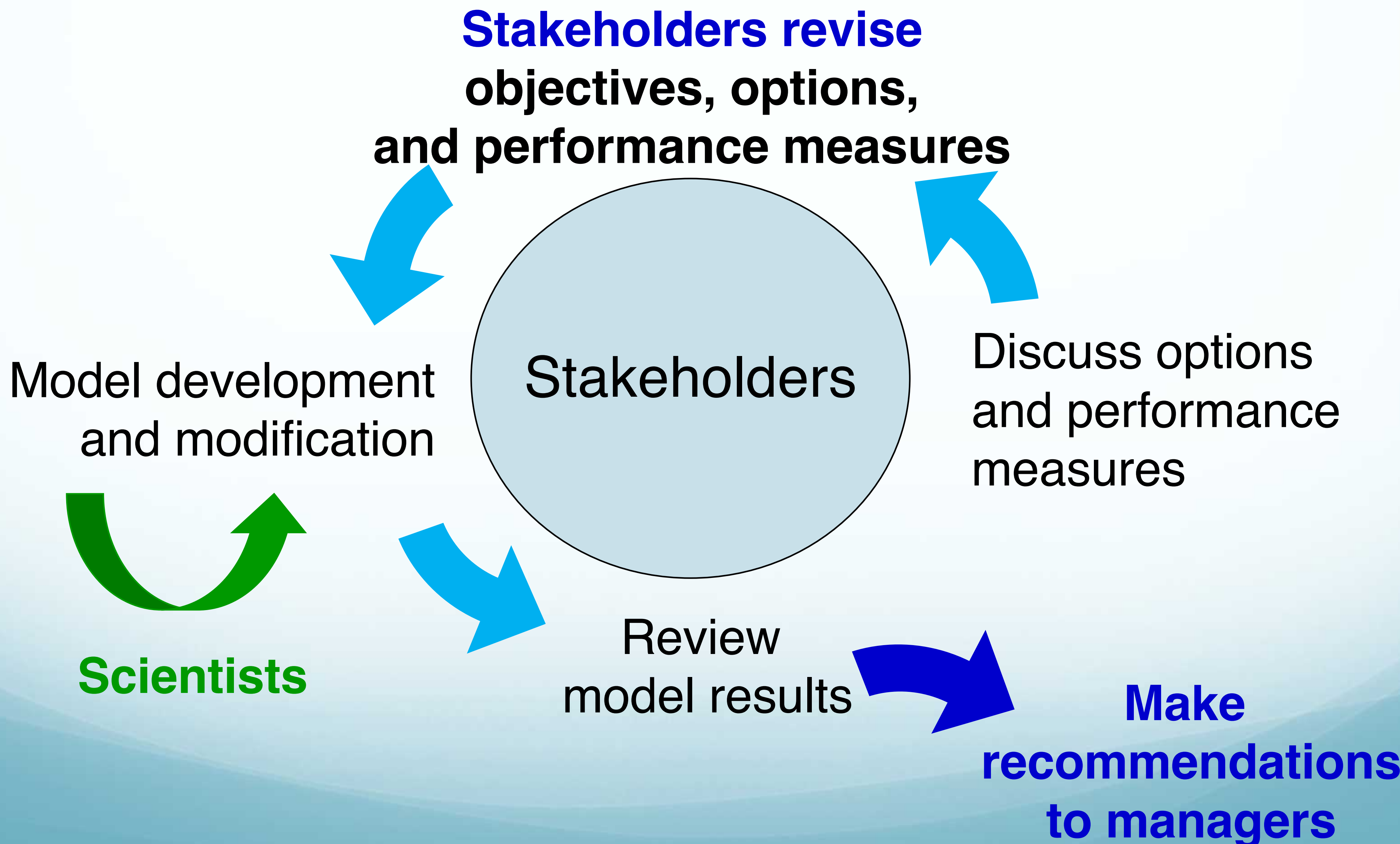
3. Clarify options that can be modeled to inform recommendations and identify those that will require policy discussions and consensus building.

Collaborative Modeling – Draft Guidance

Conducting the Collaborative Modeling & Consensus Building Process

4. Evaluate progress iteratively and interactively.
5. Both the model and the process should remain transparent to all participants.
6. Avoid technical jargon, acronyms and field-specific language.
7. Document and share with the stakeholders the model and the process.

STAKEHOLDER-CENTERED APPROACH TO COLLABORATIVE MODELING



QUESTIONS, COMMENTS AND DISCUSSION

JEFF A. BLAIR

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About The Presenter

Jeff A. Blair has over 30 years of experience in assessing and analyzing complex issues and facilitating meetings designed to build consensus between stakeholder interests, and is the principle and owner of **Facilitated Solutions, LLC**. In addition, Jeff is retired research faculty at Florida State University (FSU) and served as Associate Director for the FCRC Consensus Center at FSU for twenty-one years. He specializes in facilitation and process design and in addition his work includes situation assessment, strategic planning and action plan implementation, and consensus-building among diverse stakeholder interests with divergent perspectives on complex issues. He has worked with federal, state, local government, non-governmental organizations, and private sector representatives to design and implement collaborative approaches to consensus-building, planning, rulemaking, and dispute resolution with an emphasis on stakeholder participation in the planning, design, implementation, and monitoring of policy actions in more than 190 projects and over 2500 meetings.

Ongoing projects include serving as process designer, lead facilitator, and conflict resolution consultant for stakeholder groups including: Florida State University's Apalachicola Basin System Initiative Community Advisory Board tasked with evaluating the adopted Apalachicola Bay System Ecosystem-Based Adaptive Management and Restoration Plan Framework using decision support tools coupled with available data and research; the Apalachicola-Chattahoochee-Flint Stakeholders (ACFS) working to develop consensus on a science-based water supply plan for the ACF Basin; and the the University of Maryland Center for Environmental Services' (UMCES) Global Defense for Coral Reef Wildlife interdisciplinary Research Team funded by the Bailey Wildlife Foundation to design and build a system to support corals and coral reef wildlife by creating habitat and removing carbon dioxide from the air.

Recently completed projects include successfully facilitating to consensus and unanimous agreement between diverse stakeholder interests: The Apalachicola Basin System Initiative Community Advisory Board on the Apalachicola Bay System Ecosystem-Based Adaptive Management and Restoration Plan Framework (November 2021); The Nature Conservancy's Pensacola Bay System Stakeholder Working Group on the Oyster Fisheries and Habitat Management Plan for the Pensacola Bay System (May 2021); the USFWS' Regional Strategic Vision Alignment Initiative on USFWS R4 Strategic Vision Alignment Plan (June 2019); the Suwannee River Partnership Steering Committee (FDACS, FDEP, SRWMD, UF/IFAS) Planning Initiative on Priority Strategic Actions Workplan (August 2018); the North Florida Regional Water Supply Partnership Stakeholder Advisory Committee (SRWMD/SJRWMD/FDEP/FDACS) on the North Florida Regional Water Supply Plan (January 2017); the Coastal SEES OysterFutures Workgroup on Recommendations for Oyster Management in the Choptank and Little Choptank Rivers (Chesapeake Bay) (May 2018); and the Gulf of Mexico Angler Focus Group Initiative on Examination of Possible Private Recreational Management Options for Gulf of Mexico Red Snapper (January 2017).