Risk Policy Report

April 15, 2026
New England Fishery Management Council

Jonathon Peros & Dr. Roger Brothers

Today's Report:

- Part 1: Risk Policy Concept and Mechanics
  - Risk Policy Concept (weightings, factors, data), update – J. Peros
  - Risk Policy Mechanics and demonstration, update – Dr. Brothers
  - Next Steps and Outlook, update – J. Peros
- Part 2: Risk Policy Application and Integration
  - Risk Policy application with ABC Control Rule, update – Dr. Brothers
  - Use of Risk Policy, outlook – J. Peros
- **No action is required today.** Action anticipated in June 2026.

Risk Policy Working Group Membership:

Risk Policy Working Group Members	
Megan Ware, ME, *Chair*	Dr. Lisa Kerr (SSC)
Dan Salerno, NH, Vice-Chair	Jonathon Peros (Council Staff)
Dr. Jonathan Deroba (NEFSC)	Dr. Naresh Pradhan (Council Staff)
Moira Kelly (GARFO)	Dr. Kevin St. Martin (SSC)
Melanie Griffin, MA	Dr. Joe Caracappa (NEFSC)
Dr. Jason McNamee (SSC)	Geoff Smith, ME
Bill Lucey, CT	Dr. Gareth Lawson (SSC)

Review of Risk Policy Objectives

- Overarching; not species or decision specific
  - Flexible, transparent, can be broadly implemented
- Use of factors which are weighted and scored.
- Can produce qualitative and quantitative outcomes.
- Will connect to ABC control rules, with an aim to improve implementation through clear linkages.
  - Will need follow-on actions (ABC control rules).
- Can accommodate various factors that are important to consider in the context of risk (biology, climate change, social impacts).

Weighting, Scoring, and Level of Risk

FACTORS

(Key elements to characterize risk)

WEIGHTING (level of importance of a factor to the Council) *Policy Choice*	×	**SCORING** (based on recent information) *Objective*	=	**LEVEL OF RISK** (added up across factors)

- The results for each factor are aggregated into a "Z-score" for level of risk that is plotted along the Risk Policy curve.

Risk Policy Tool / ABC Control Rules

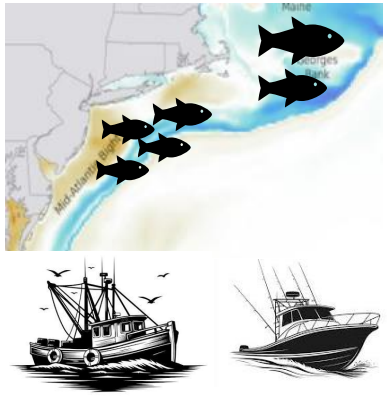
Risk Policy Concept (Tool)

Factors (5)

1. Global Weighting

Weights apply to all stocks

2. Scoring (data)



3. Z-Score

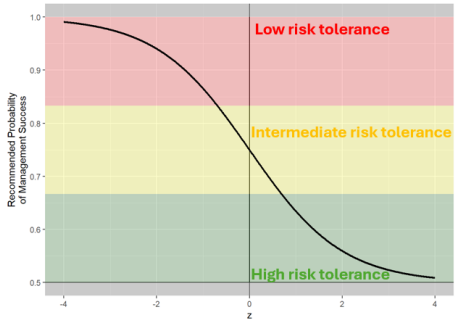
Combination of weights and scores.

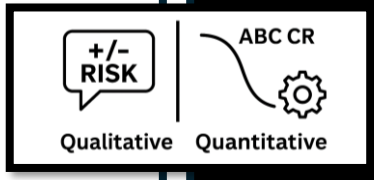
$$Z = \sum (w_i s_i)$$

w = weights
s = scores

4. Risk Tolerance

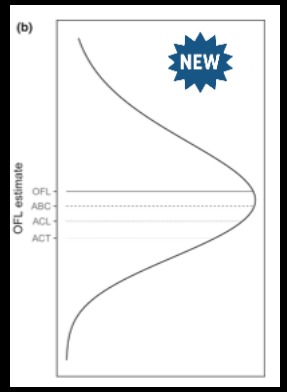
NEW





ABC Control Rule

5. Set ABC using Risk Policy + HCR (Example)



Risk Policy Concept – Updates

- Factors → Fewer Factors (5), specify goals, scoring guidance

- Mechanics → Shape of the curve changed, direction of scoring
- Risk Tolerance (High, Low)

- Approve Revised Concept, conduct weightings, discuss use

Council Weighting Process

- One weight for all Council managed resources → "Global Weighting"
- Done on paper.
- Only voting Council members participate.
- Limit the number of factors that can be weighted as "critically important".
- Conducted after approval of revised concept.

Weighting Exercise

Complete the grid below by assigning a weight for each factor. You can choose any whole number between 0 and 4. A weighting of 0 means you believe the factor is not important in determining the Council's risk tolerance for that managed resource. A weighting of 4 you believe the factor is critically important in determining the Council's risk tolerance for that managed resource. Do not use a weight of "*Critically Important 4*" more than two times.

Factor	*Least Important* 0	*Slightly Important* 1	*Important* 2	*Highly Important* 3	*Critically Important* 4
Biomass/Stock					
Recruitment					
Climate Vulnerability					
Recreational Fishery Characterization					
Commercial Fishery Characterization					

Biomass (SSB) / Stock Status

- **Risk associated** with current productivity of the stock
- **Relationship to Risk:** As status (SSB/SSB_{MSY}) increases, risk tolerance increases
- **Use in 2026,** no changes to scoring proposed
- **Directionality:** Two way, can increase and decrease risk tolerance

FACTOR	-4	-3	-2	-1	0	1	2	3	4
SSB / Stock Status	Below threshold		<75% but above Threshold		Neutral		Rebuilt		Well Above Target

Recruitment

- **Risk associated** with future productivity of the stock
- **Relationship to Risk:** As recruitment increases, risk tolerance increases
- NEW **Use in 2026,** changes to how factor is scored (quantiles)
- **Directionality:** Two way, can increase and decrease risk tolerance

Lower Risk Tolerance ← → Higher Risk Tolerance

FACTOR	-4	-3	-2	-1	0	1	2	3	4
Recruitment	Persistent Low Recruitment		Recent Low Recruitment		Average, No Trend		Recent Large Year Classes		Multiple Large Year Classes

Climate Vulnerability

- **Risk associated** with climate change
- **Relationship to Risk:** As climate vulnerability increases, risk tolerance decreases
- NEW **Use in 2026,** old guidance, plus PDT input for stock level scoring
  - Vulnerability score and directional effect of climate change (Hare et al., 2016)
- **Directionality:** One way, only decreases risk tolerance

Lower Risk Tolerance ← → **Higher Risk Tolerance**

FACTOR	-4	-3	-2	-1	0	1	2	3	4
Climate Vulnerability	High Negative Direction	High	Moderate, Negative Direction	Moderate	Low				

Commercial Fishery Characterization

- **Risk associated** with socioeconomic health of the commercial fishery
- NEW **Relationship to Risk:** As socioeconomic stress increases, risk tolerance increases
- **Use in 2026,** changes to scoring questions, consider AP input JUNE
- **Directionality:** One way, can only increase risk tolerance

Lower Risk Tolerance ← → Higher Risk Tolerance

FACTOR	-4	-3	-2	-1	0	1	2	3	4
Commercial Fishery Characterization					Minimal stress	Low stress	Moderate stress	Elevated stress	High stress

Recreational Fishery Characterization

- **Risk associated** with socioeconomic status of the recreational fishery
- NEW **Relationship to Risk:** socio-economic stress increasing and lower levels of recreational data uncertainty that lead to higher risk tolerance
- **Use in 2026,** changes to scoring questions, consider AP input JUNE
- **Directionality:** One way, can only increase risk tolerance

Lower Risk Tolerance ← → Higher Risk Tolerance

FACTOR	-4	-3	-2	-1	0	1	2	3	4
Recreational Fishery Characterization					Minimal stress	Low stress	Moderate stress	Elevated stress	High stress

Commercial and Recreational Factors

Areas of Focus

Commercial:

- Quota Utilization
- Communities (SOE)
- Revenue
- Constraining species / choke stocks
- Advisory Panel input

Recreational:

- Quota Utilization (stocks with sub-ACL)
- Fleet Diversity (SOE)
- Angler Trips
- Data Quality (PSE)
- Management Consistency
- Recreational Advisory Panel input

Both factors will be scored using responses to a series of questions that aim to assess stress and vulnerability.

Risk Policy Demonstration

April 15, 2026

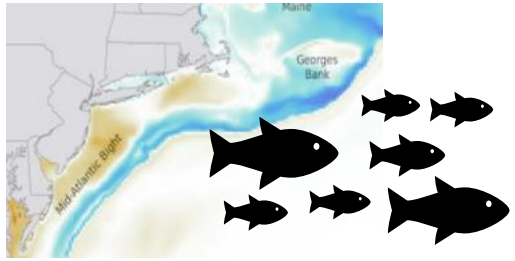
New England Fishery Management Council

Risk Policy Concept (Five Factors)

1. Factor Weighting

Weights apply to all stocks

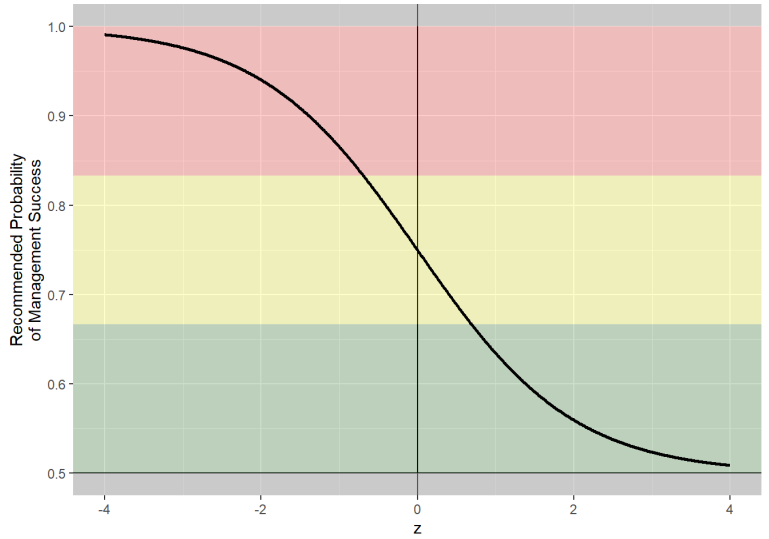
2. Factor Scoring (Data)



3. Factors Combined into a single Z-Score

$$Z = \sum (w_i s_i)$$

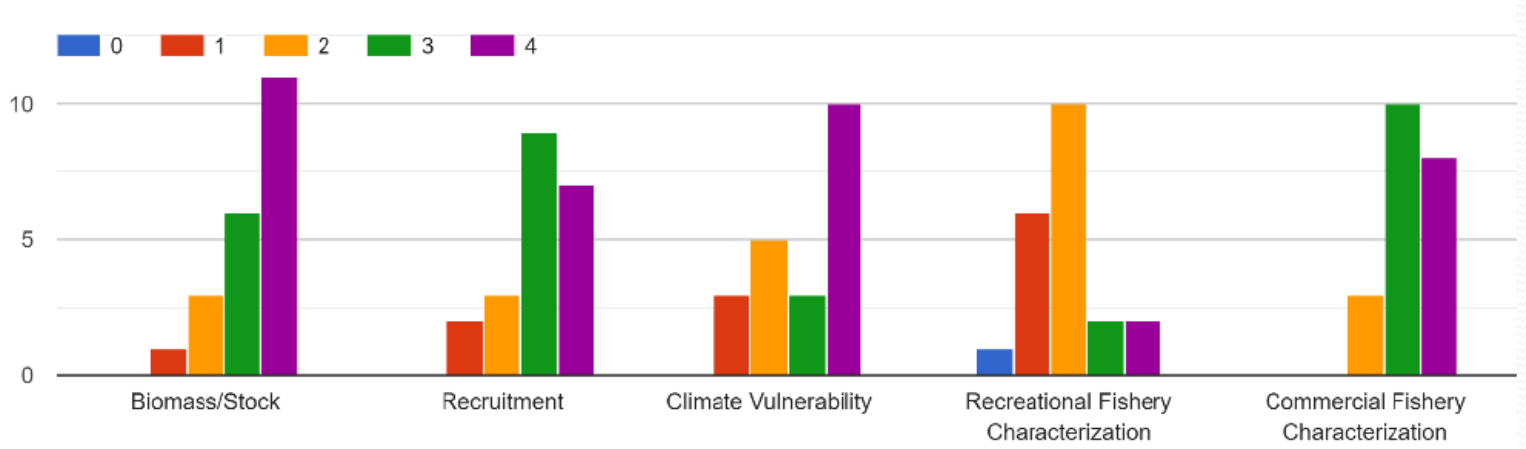
4. Risk Tolerance



Factor Weighting

- Policy decision determining how influential each factor is in risk tolerance
- Weighting will be conducted by the NEFMC

Histogram of mock factor weightings (global, all stocks) across NEFMC members



Risk Policy Mock Factor Weights (NEFMC mean)

Scale	SSB	Recruitment	Climate	Recreational	Commercial
Mean (0-4)	3.29	3.00	2.95	1.90	3.24
Normalized, Sum(weights)=1	0.23	0.21	0.21	0.13	0.23

Factor Scoring

- Objective characterization of the state of each stock
- Scoring will be conducted by Plan Development Teams

Lower Risk Tolerance ← → Higher Risk Tolerance

FACTOR	-4	-3	-2	-1	0	1	2	3	4
SSB / Stock Status	Below threshold		<75% but above Threshold		Neutral		Rebuilt		Well Above Target
Recruitment	Persistent Low Recruitment		Recent Low Recruitment		Average, No Trend		Recent Large Year Classes		Multiple Large Year Classes
Climate Vulnerability	High Negative Direction	High	Moderate, Negative Direction	Moderate	Low				
Commercial Fishery Characterization					Minimal stress	Low stress	Moderate stress	Elevated stress	High stress
Recreational Fishery Characterization					Minimal stress	Low stress	Moderate stress	Elevated stress	High stress

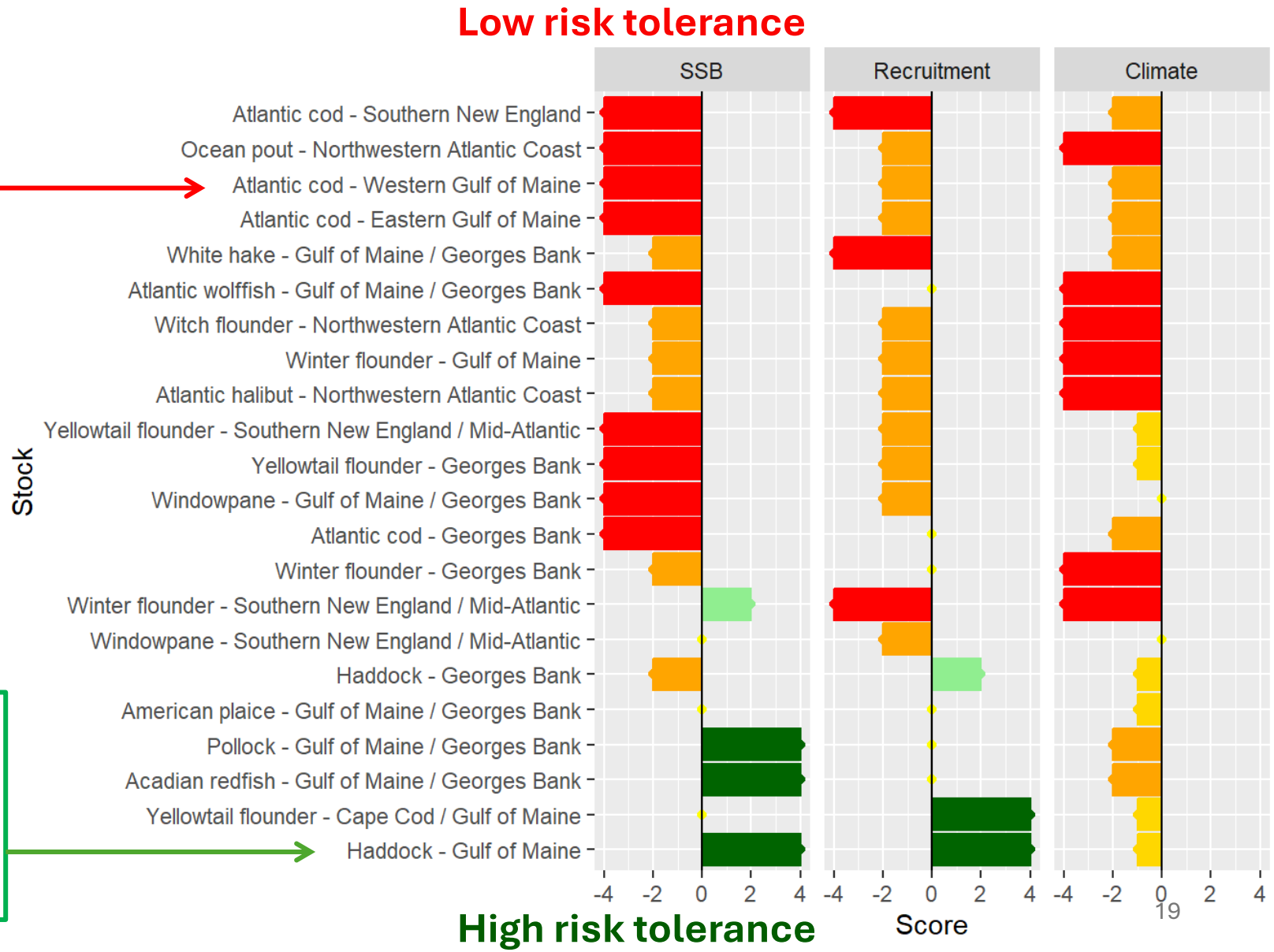
Demonstrated Factor Scoring: 22 groundfish stocks

Cod, Western Gulf of Maine:

- SSB below threshold
- Low recent recruitment
- Moderate climate vulnerability and negative impact

Haddock, Gulf of Maine:

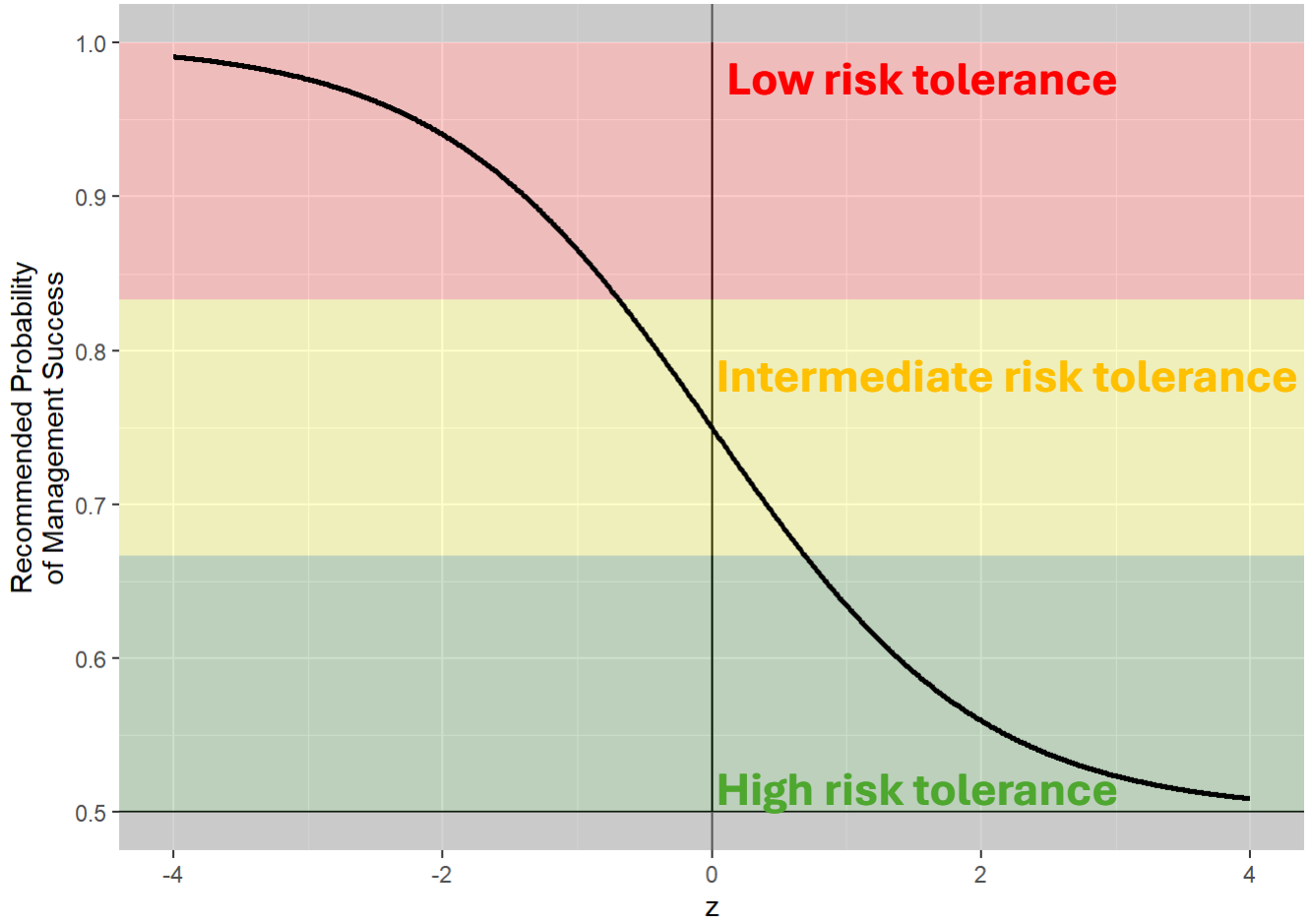
- SSB well above target
- Multiple large year classes
- Moderate climate vulnerability



Recommended Probability of Management Success

- All 5 factors combined into a Z-score
- Working Group selected a logistic function to calculate a recommended risk tolerance

- Approaches extreme values slowly
- More responsive in between
- High and low risk tolerance are hard to achieve but stable



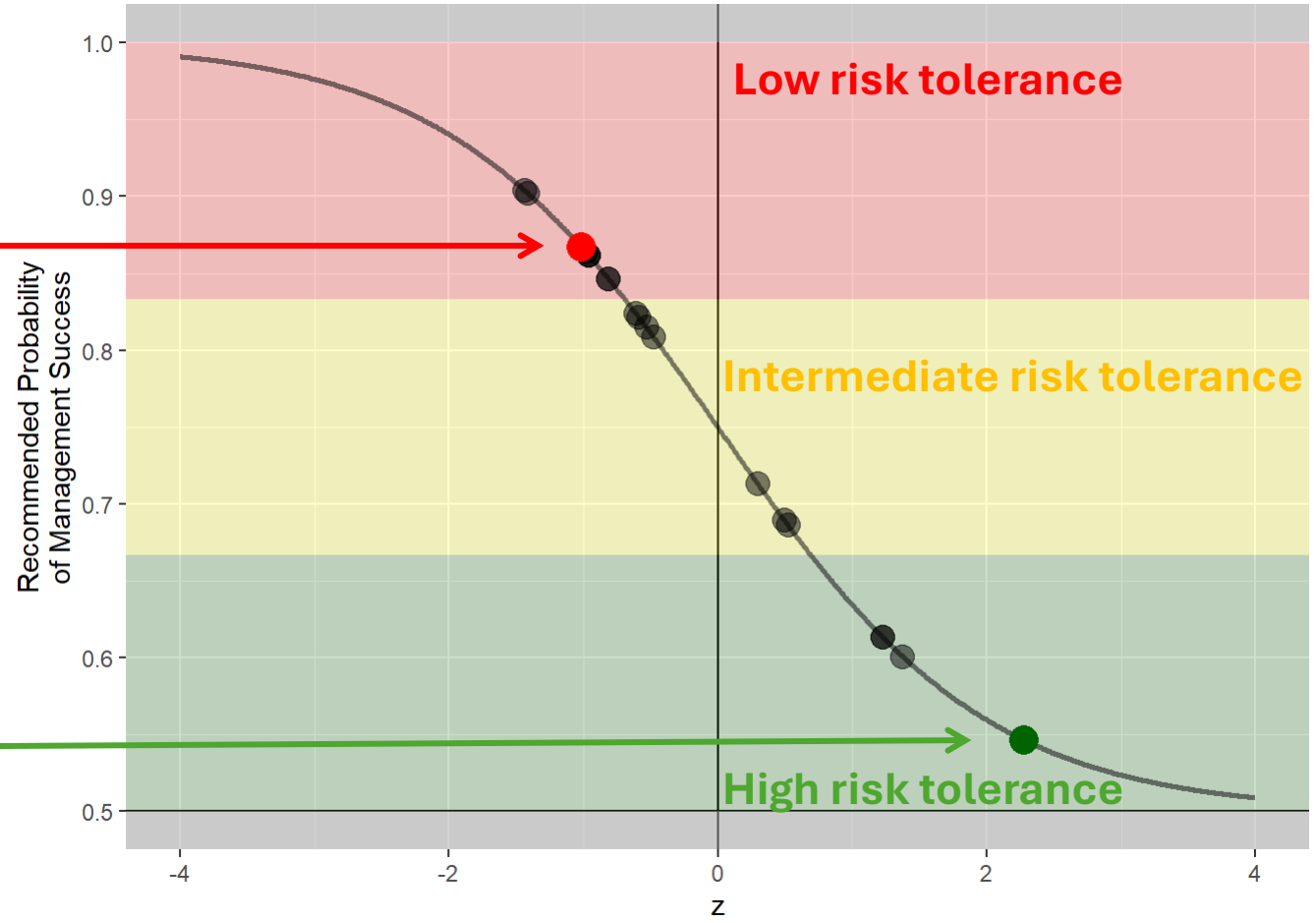
*Risk Tiers are for demonstration. They have not been determined by the Working Group

Recommended Probability of Management Success

Assumed an intermediate score of 2 for both the commercial and recreational fishery factors

Cod, Western Gulf of Maine

Haddock, Gulf of Maine



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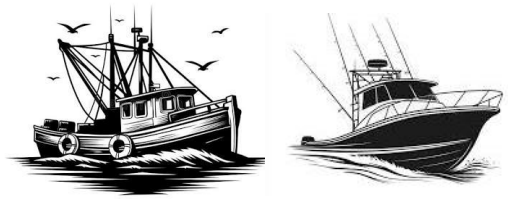
Influence of Two Fishery Factors

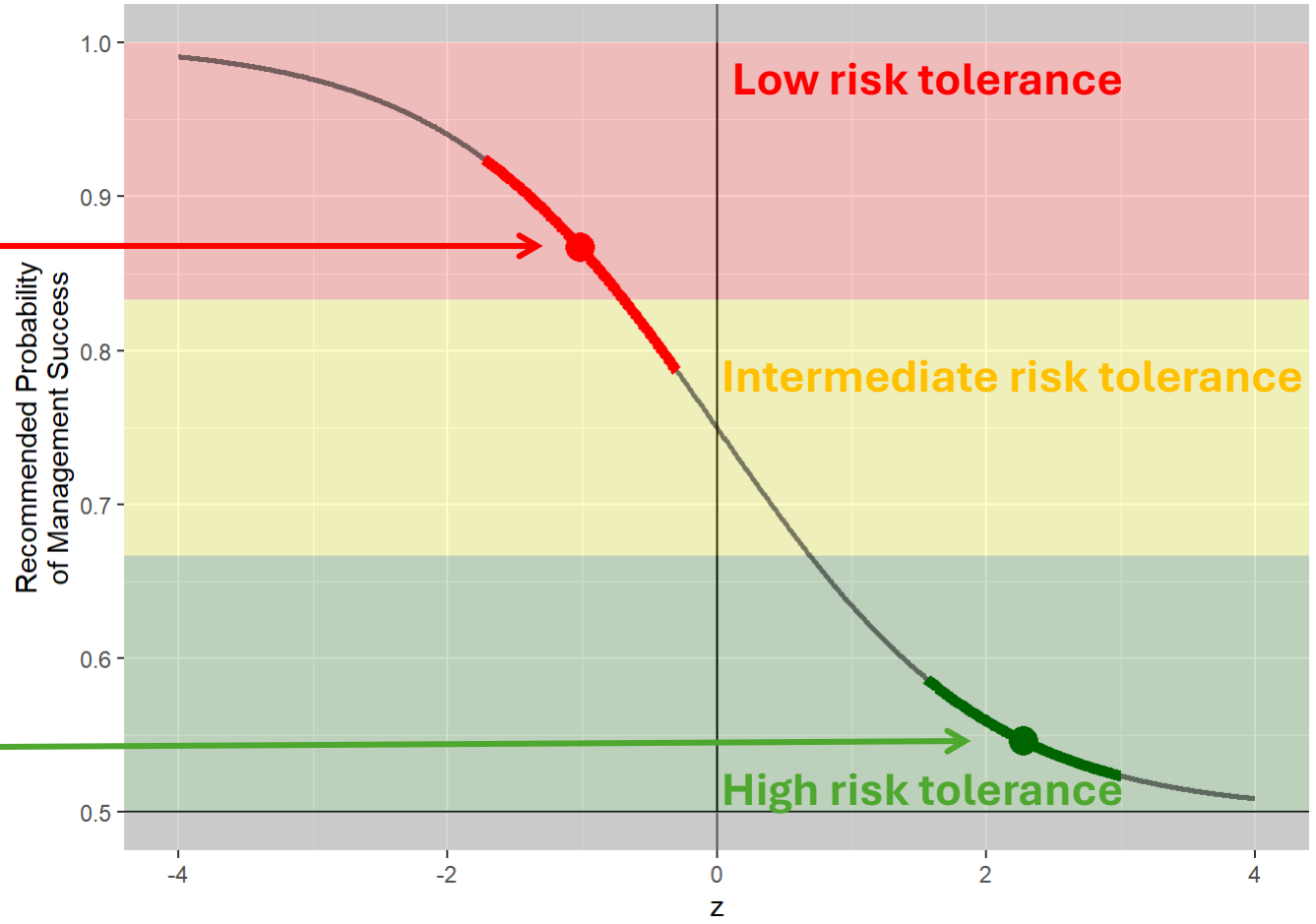


● Score assumption of “2” for both fishery factors

— Minimum (0) to maximum (4) assumption for both fishery factors

Cod, Western Gulf of Maine

Haddock, Gulf of Maine



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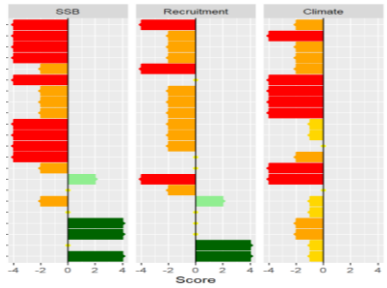
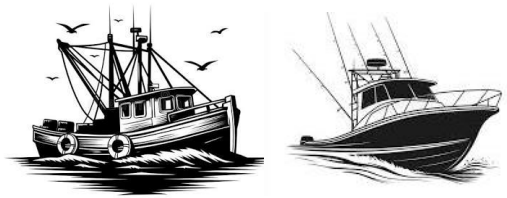
Risk Policy Concept + ABC Control Rules

1. Factor Weighting

Weights apply to all stocks

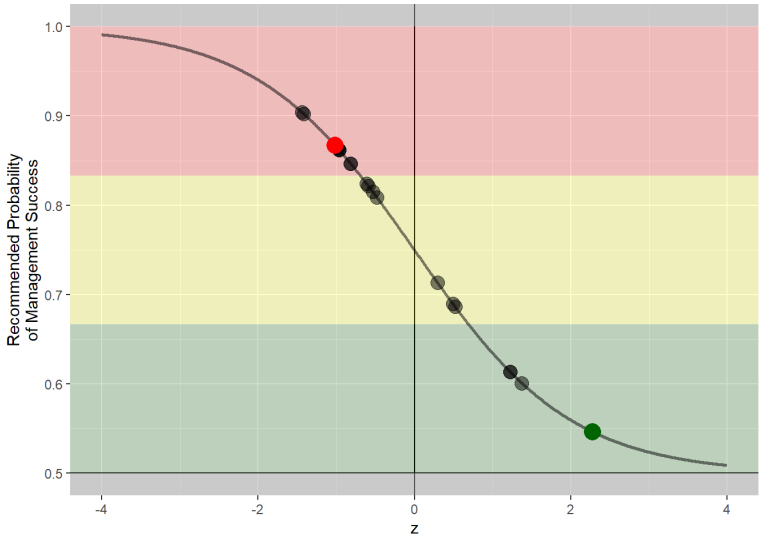
2. Factor Scoring (Data)





3. Factors Combined into a single Z-Score

4. Risk Tolerance



5. Set ABC using Risk Policy Integrated Control Rule

Low Risk Tolerance = ABC Farther from OFL

High Risk Tolerance = ABC Closer to OFL

Risk Policy Outlook

- **June 2026:** Council approve revised Risk Policy Concept, complete weightings, guide use
  - ❑ Revised Concept document and appendices (scoring, weighing, mechanics, catalogue).
  - ❑ Global weightings (1 weight for each factor that applies to all stocks).

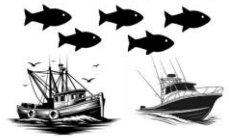
- **Summer/Fall 2026:**
  - Council weights and PDT scores generate Z-score, level of risk tolerance.
  - Develop guidance to inform qualitative and quantitative use of the Risk Policy.
  - Other ongoing processes, notably Groundfish Framework 68.

Upcoming Work and Meetings:

Factors (5)

1. Global Weighting

2. Scoring (data)



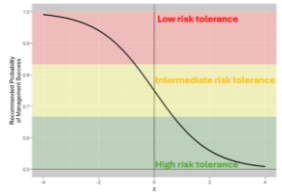
Finalize data and scoring guidance

3. Z-Score

Combination of weights and scores.

$$Z = \sum(w_i s_i)$$

4. Risk Tolerance



Qualitative interpretation

- *April 15th – April Council Meeting (Portland)*
- *June 3rd – RPWG Meeting (Webinar @1pm)*
- *June 23rd-25th – June Council Meeting – Approve Concept and Council Weightings*

Questions?

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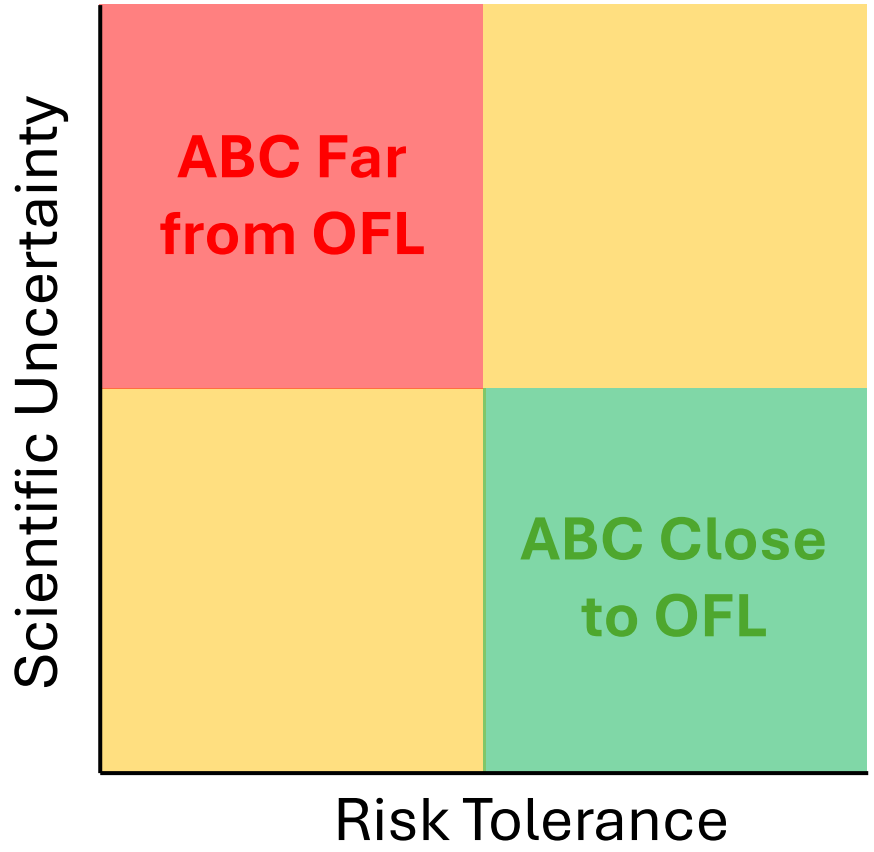
Potential Risk Policy Integrated ABC Control Rules

Defining the Acceptable Biological Catch (ABC)

- The ABC is set below the OFL to account for scientific uncertainty
- The magnitude of buffer can depend on the degree of scientific uncertainty
- In a Risk Policy integrated approach, it would also depend on the specified Risk Tolerance



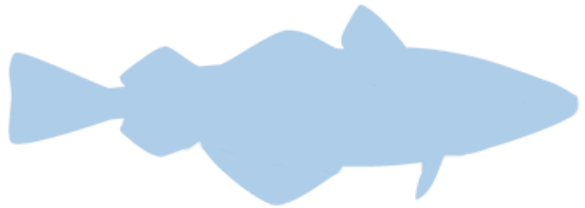
Integrating the Risk Policy into ABC Control Rules Could:

- Directly incorporate a wider range of criteria when setting catch advice, with an opportunity to add more risk factors.
  - Climate impacts on stock dynamics
  - Socioeconomic considerations and importance
  - Broader ecosystem considerations (future consideration)
  - Assessment type and performance (future consideration)

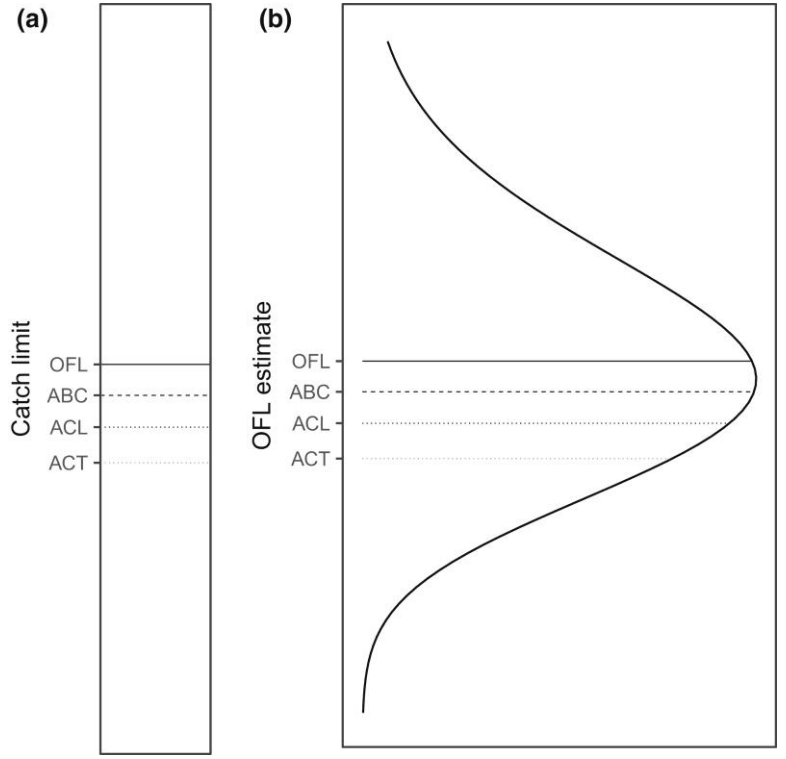
- Allow ABC's that are closer to the OFL and farther from the OFL
  - Might lead to more fishing opportunities and faster rebuilding
- Provide objective criteria defining when to move in each direction
- There are many potential options

Two distinct approaches for determining the scientific uncertainty buffer

a) A simple percentage buffer
   - For example: the ABC is 75% of the OFL



b) A distribution/probability-based approach
   - ABC is determined by an acceptable probability of overfishing (e.g., P* = 0.25)

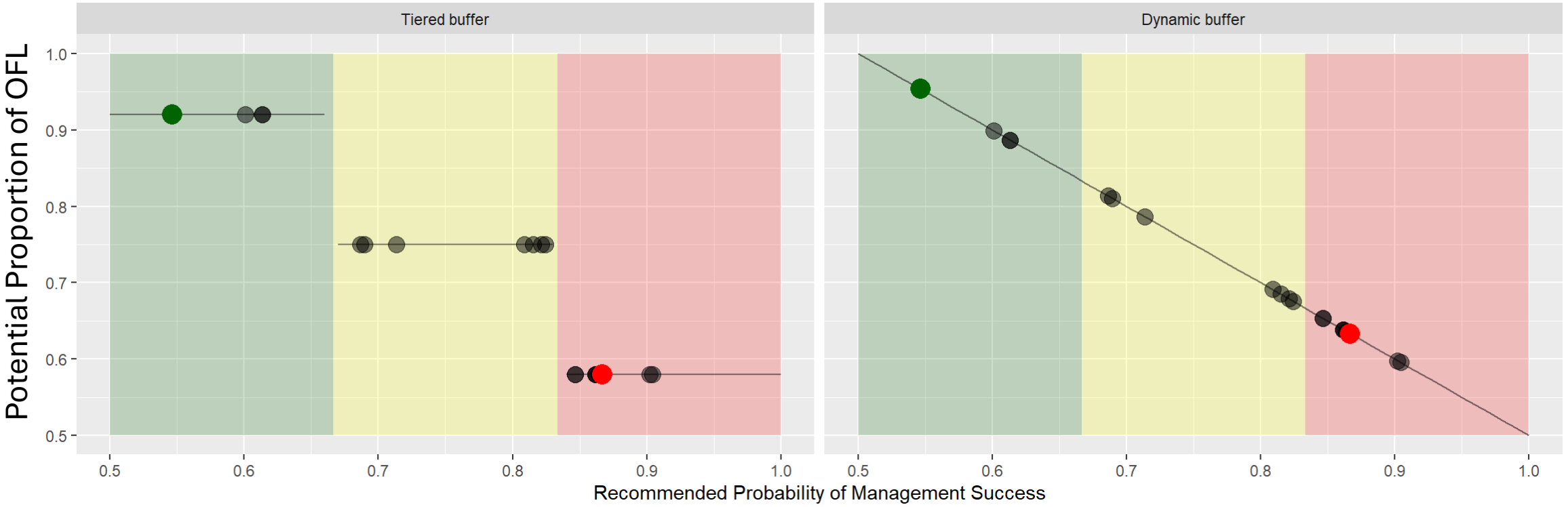


Both are used by the NEFMC and can quantitatively integrate the revised Risk Policy

Potential Percentage of OFL Approach

Cod, WGOM

Haddock, GOM

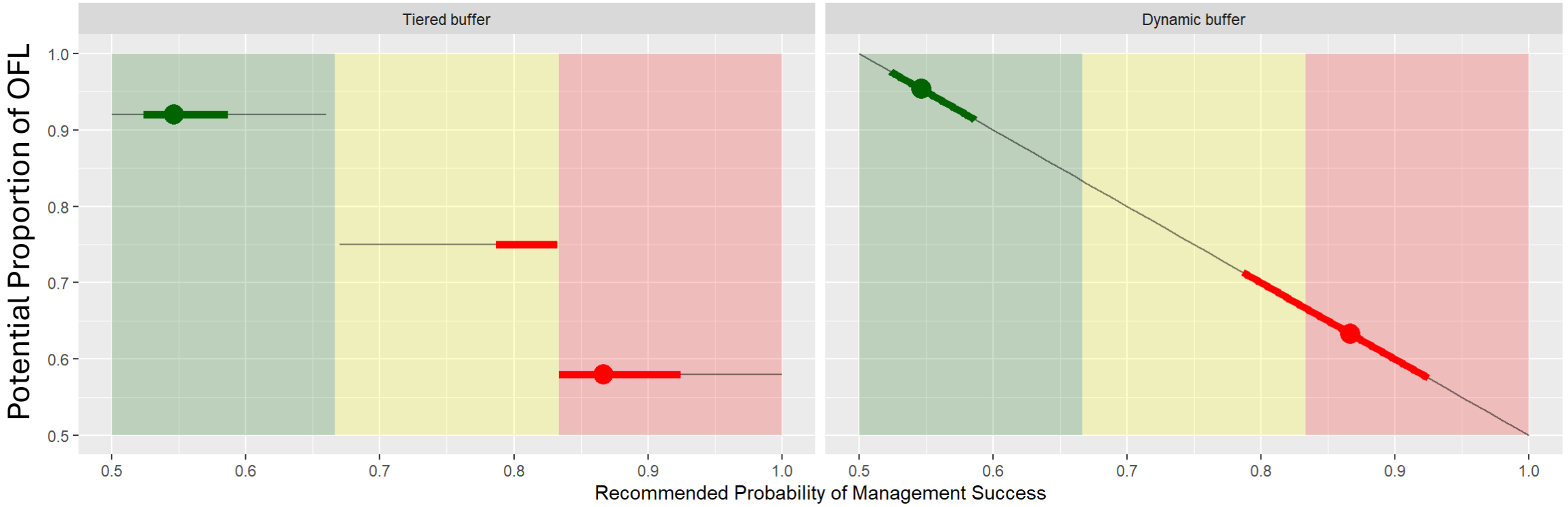


- The rule could apply a continuously changing buffer (right), or fixed proportions in discrete risk tiers (left)
- For both, ABC = 75% of OFL at intermediate risk tolerance and the proportion changes according to the results of the Risk Policy
- Both require additional policy decisions (e.g., range of buffers, boundaries of risk tiers). We made assumptions for demonstration.

Potential Percentage of OFL Approach

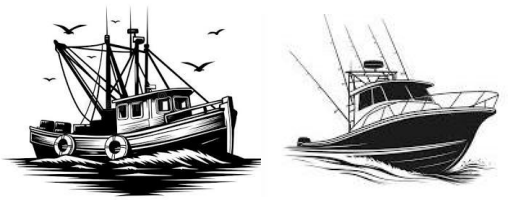
Cod, WGOM

Haddock, GOM



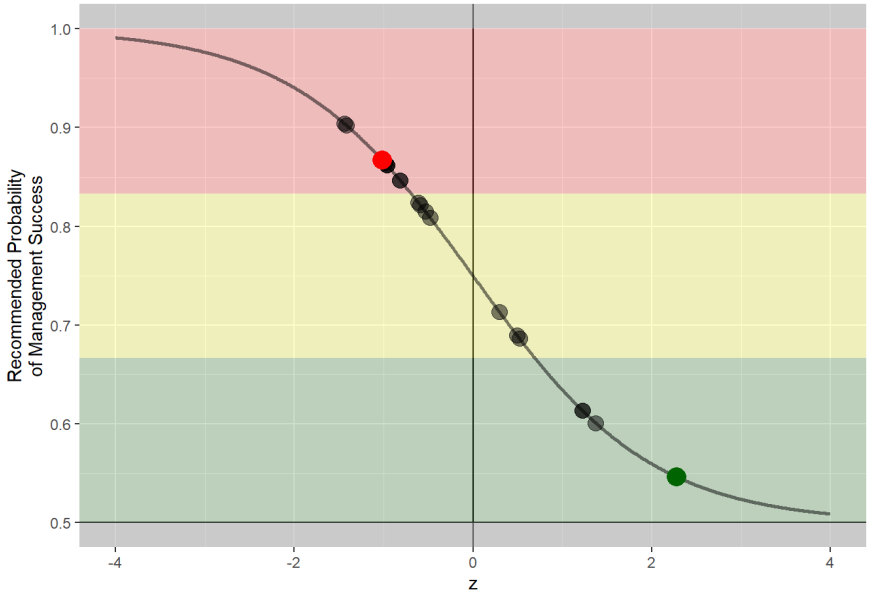
The two fishery factors would have a substantial impact on the results of both potential Control Rules

- ● Intermediate assumption for both fishery factors
- —— Minimum to maximum assumption for both fishery factors

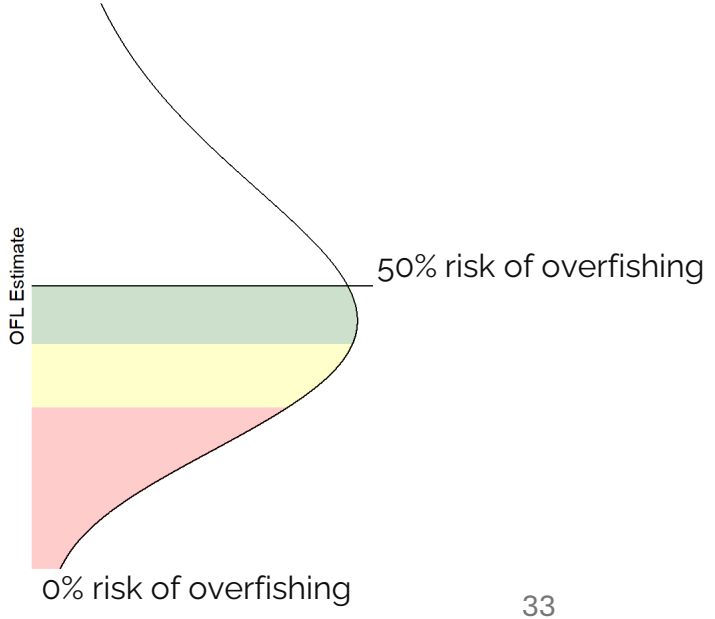


Potential Probability-Based Approach

- For catch limits, management success is avoiding overfishing
- Risk Policy could inform the acceptable probability of overfishing (P*)
- The exact buffer between the ABC and OFL would also depend the assumed distribution around the OFL



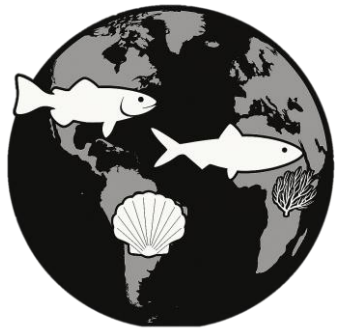
P* informed by Risk Policy



Risk Policy Concept and ABC Control Rules

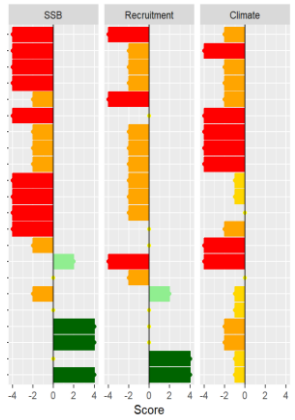
Risk Policy with Five Factors

1. Factor Weighting



Weights apply to all stocks

2. Factor Scoring (Data)



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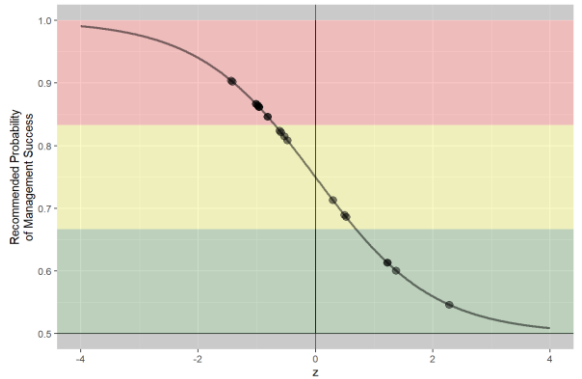
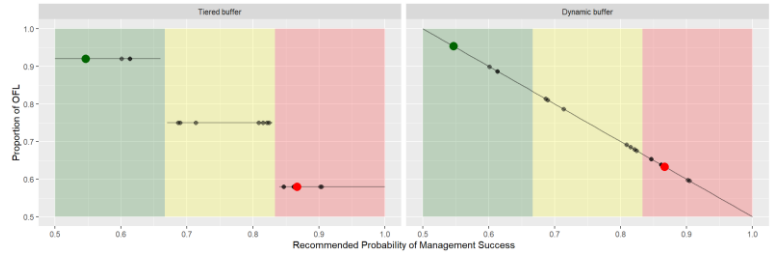


4. Risk Tolerance

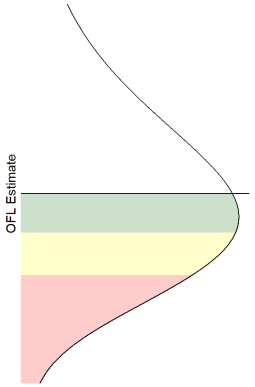
Potential Risk Policy Integrated ABC Control Rules

5. Determine Scientific Uncertainty Buffer

a) Risk Policy Informed Proportion of OFL



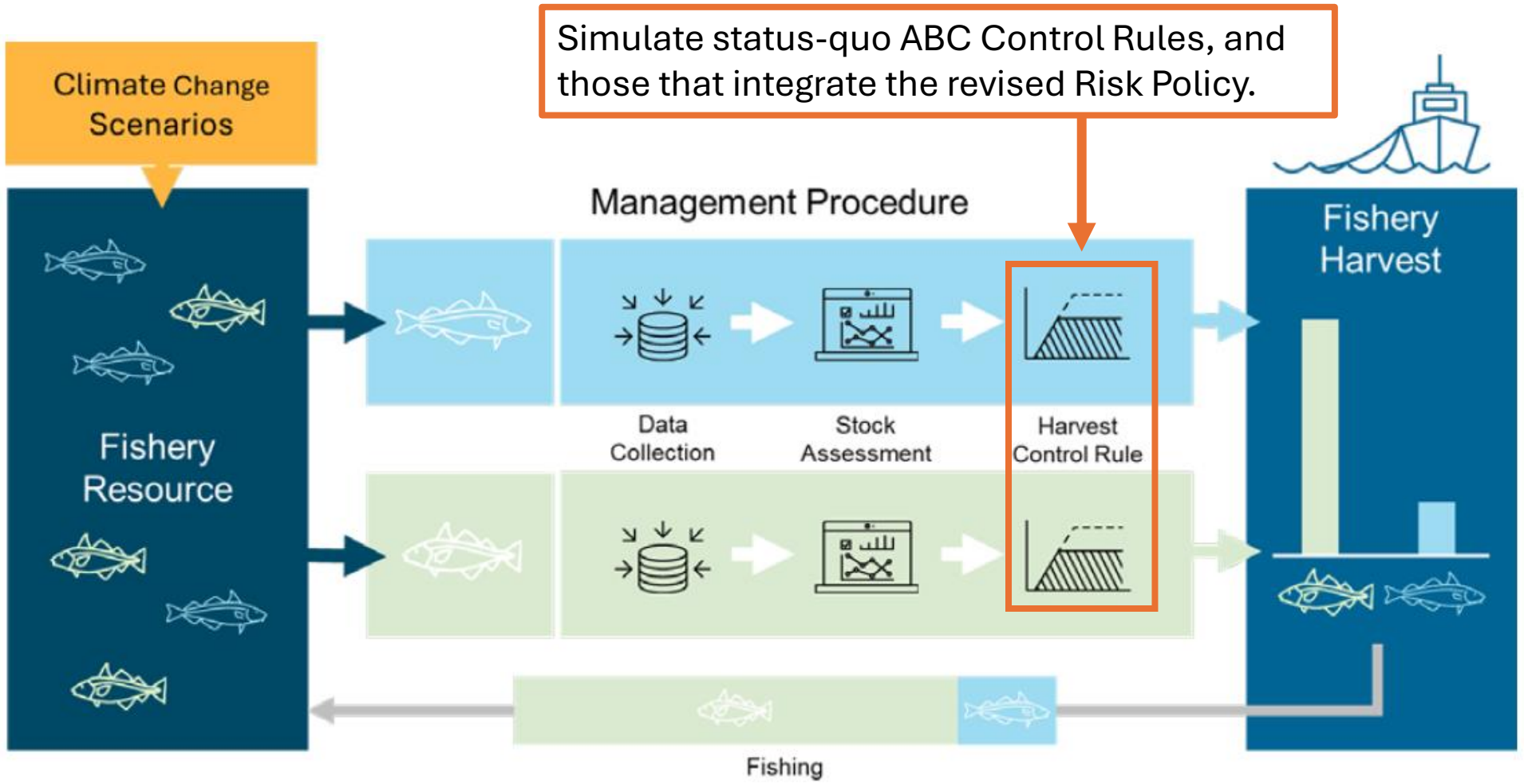
Risk Policy Informed P*



b) Probability-based approach

Goals of Simulation Testing

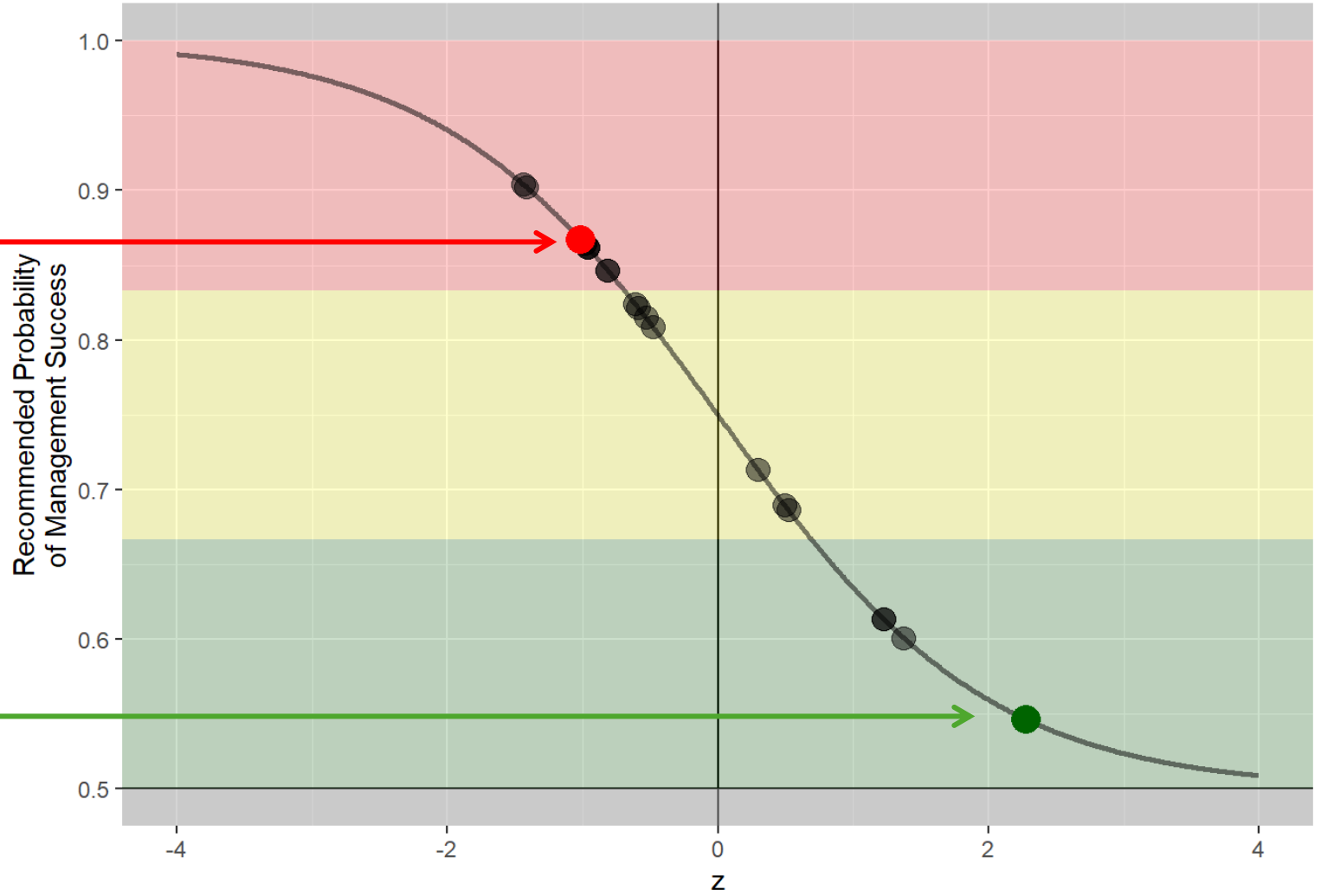
Use management strategy evaluation to test the performance of Risk Policy integrated **ABC Control Rules**



Two Focal Stocks with Varied Risk Policy Results

Cod, Western Gulf of Maine:
- Overfished
- Low Risk Tolerance

Haddock, Gulf of Maine:
- SSB well above target
- High Risk Tolerance



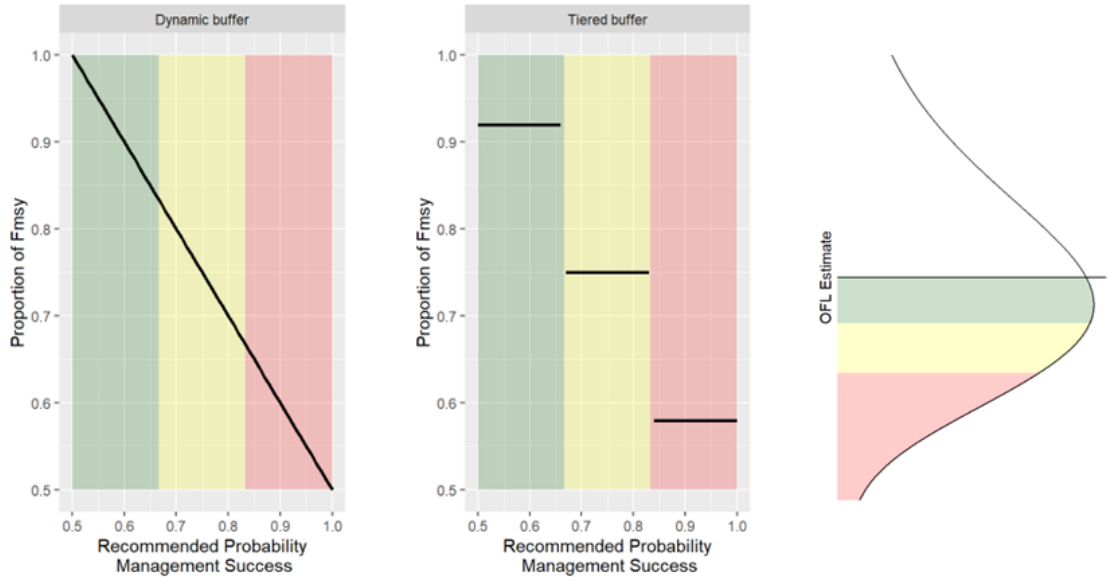
Simulating Alternative Groundfish Control Rules

Status Quo

- ABC specified as % of OFL
- Percentage changes with status

3 Risk Policy Integrated Alternatives

- Dynamic buffer
- Tiered approach
- Probability-based option (P*)



Potential Performance Metrics

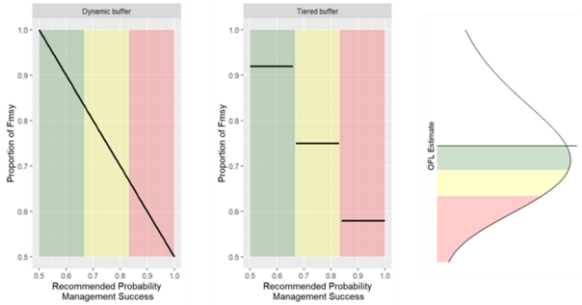
- Responsiveness of Control Rule results to changing conditions
- Stock Sustainability
  - Stock status
  - Time to rebuild
- Harvest opportunities
  - Catch advice
  - Realized catch

We will use these, and others, to compare the performance of status-quo and Risk Policy integrated ABC control rules.

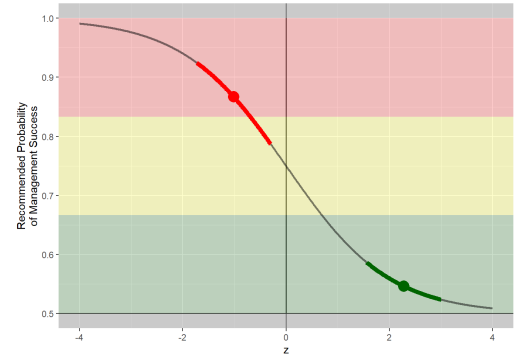
Use of Risk Policy

- Recent consideration around how the Scientific and Statistical Committee (SSC), PDTs use the Risk Policy.
- Two key areas:
  1. Integration with ABC Control Rules. (Dr. Brothers)
  2. Qualitative use of the Risk Tolerance output (Z-score on curve).
- Council will direct how its bodies use Risk Policy (PDT, SSC).

1. Integration with ABC CRs



2. Use of Risk Tolerance



New England Fishery Management Council

Questions?