

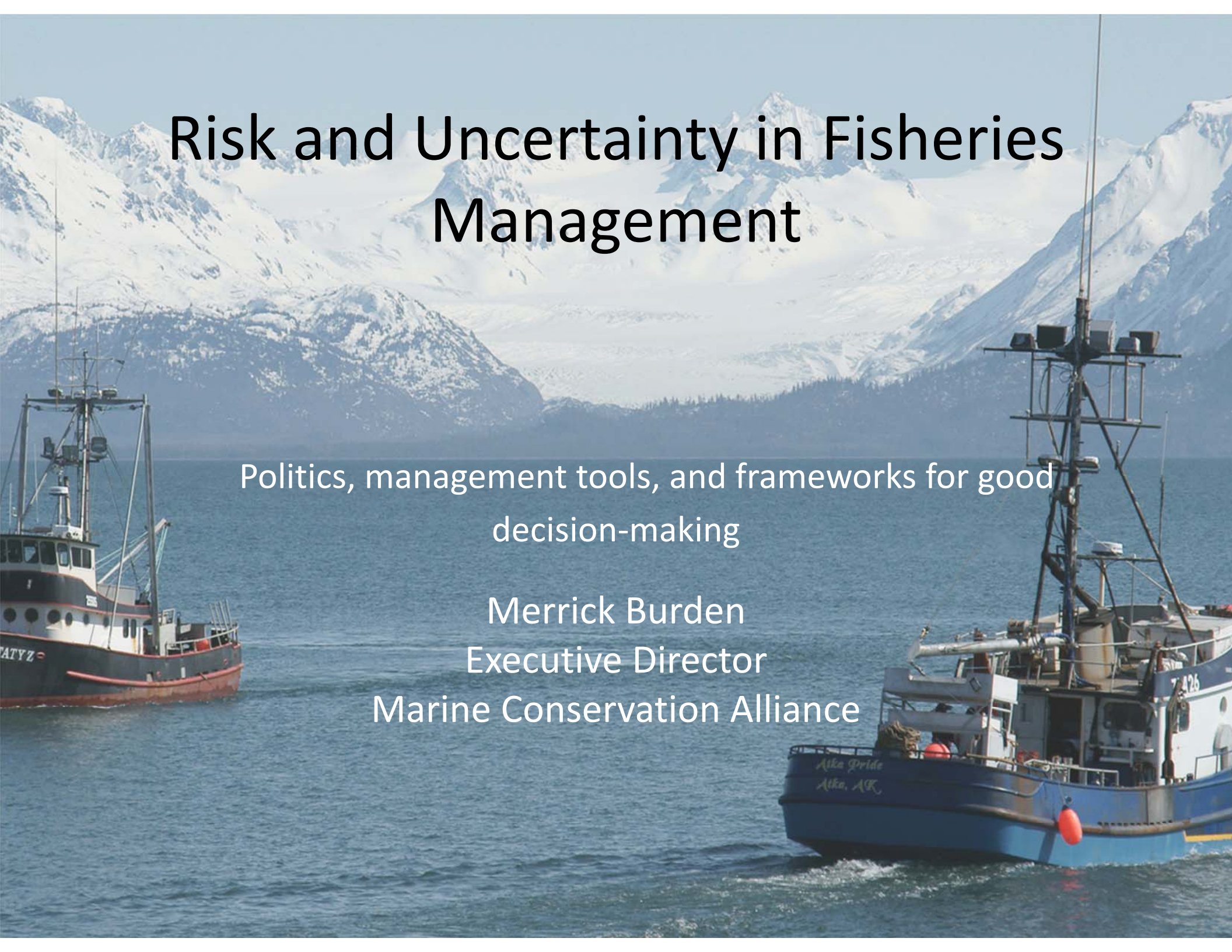
# Risk and Uncertainty in Fisheries Management

Politics, management tools, and frameworks for good decision-making

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# If you only take away a few things out of our time together....

- Risk management is a multi-variable construct that is a mix of science and policy
- Today, Councils often do not engage in risk management, though they say they are
  - Existing policy approaches polarize economic and biological risk. The politics often stand in the way.
- More policy pathways for dealing with risk, combined with formalized decision frameworks, could help Councils to better manage risk



# Risk or Uncertainty?

Consequences: What's the cost of being wrong

1. Is the stock at healthy levels of abundance, or is it overfished?
2. Does the stock grow quickly or slowly?
3. Does it play a key role in the ecosystem?

# Types of risk relevant to fisheries

## Biological and ecological

Tied to measures of stock status and a stock's trophic role

- Does the stock care if it's at  $B_{msy}$  or some other level?
- Are the populations of one species substantially affected by the status of another?

## Economic

Tied to the ability to generate MSY

- Do we risk reducing the productive potential of a stock?
- Do we risk going into a rebuilding mode?
  - Mixed stock fisheries: will this become a choke species?
  - How long will it take to rebuild?
- Short term yield vs. Long durability

# Do Councils really manage risk?

## Consider:

- Fully developed fishery
- Data poor assessments
- Following Pstar approach would result in dramatic reductions in ABC

## Council's decision is either:

- A) Reduce risk to stock abundance by following Pstar approach and restricting fisheries, or
- B) Avoid short term economic consequences by refusing to follow Pstar approach and setting ABC near OFL and arguing that this is a conscious decision of a risk-policy

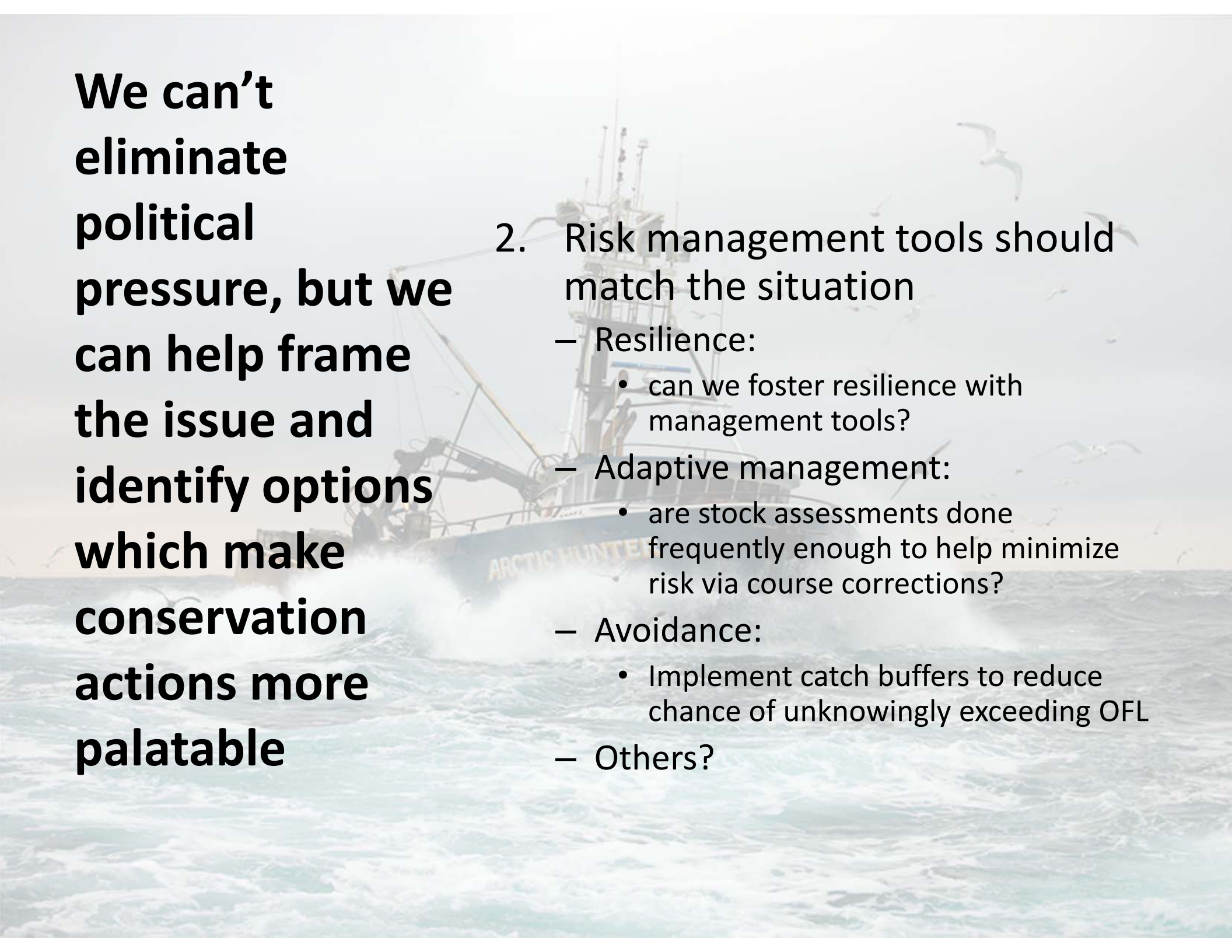
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## 1. Frame the issue

A. Risk-based management instead of uncertainty

- Risk to stock status:
  - chance it will go into overfished status?
  - How long of a rebuilding period might we face if it does?
- Ecological risks
- Economic risks

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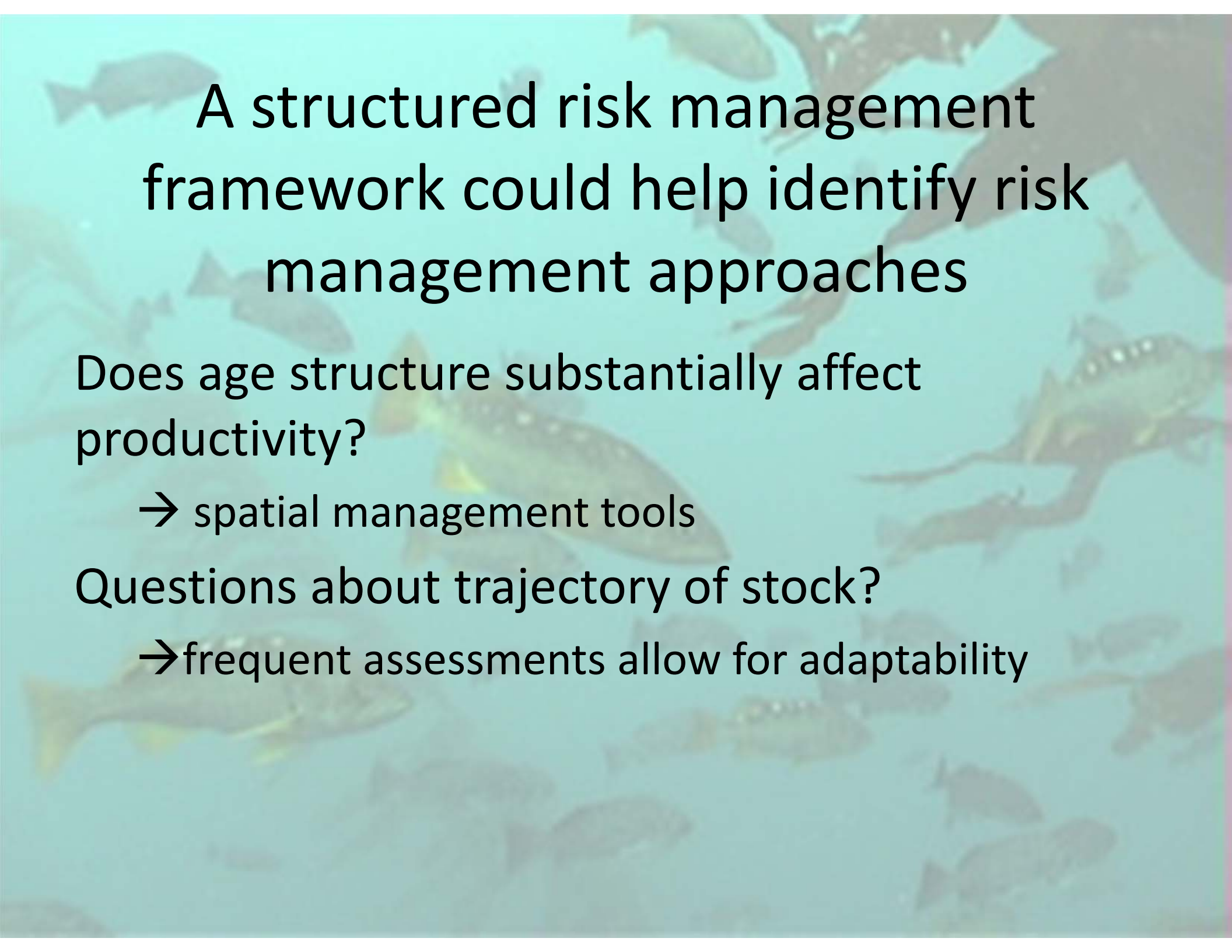
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2. Risk management tools should match the situation
- Resilience:
    - can we foster resilience with management tools?
  - Adaptive management:
    - are stock assessments done frequently enough to help minimize risk via course corrections?
  - Avoidance:
    - Implement catch buffers to reduce chance of unknowingly exceeding OFL
  - Others?

# How does one establish a risk policy?

Acceptable levels of risk can be established through a structured framework

- Itemize potential consequences
- Identify our tolerance for those consequences
  - Based on economic, biological, and ecological considerations
- Identify the chances of those outcomes occurring
  - Based on several factors like SA uncertainty, existing stock status, management capabilities, etc





# A structured risk management framework could help identify risk management approaches

Does age structure substantially affect productivity?

→ spatial management tools

Questions about trajectory of stock?

→ frequent assessments allow for adaptability

# Key points

- Risk management is an important aspect of fishery management
- A variety of factors need to be overcome for risk management to be used responsibly and effectively
  - Communication with policy makers about the possible consequences of their actions
  - Decision making framework that encompasses policy and scientific aspects of risk
  - Identification of, and guidance on how to use, a suite of approaches for dealing with risk