

Climate Change Effects on Capture Fisheries Economic and Policy Issues

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Outline

Introduction

Biophysical change

Economic effects

Governance effects

Policy options

Key conclusions



Pacific Whiting

K. Quigg Seattle Times

Introduction

Linkages and the Pathway of Climate Impacts

Physical oceanic change



Introduction

Three U.S. Pacific Examples

- Pacific sardine
- Humboldt squid
- Pacific salmon



Climate Change Effects on Fisheries

Biophysical effects will lead to ecosystem change beyond normal range of conditions.

Physical

- temperature
- stratification
- coastal upwelling
- sea levels
- acidification
- ENSO
- currents

Biological

- species distribution
- primary productivity
- stock productivity
- species substitution

Economic Effects of Climate Change

Economic effects
depend on the
context.

Positive or negative

Benefits: sardine

Costs: squid/whiting

Redistribution of
benefits : salmon



Economic Effects of Climate Change

Key Economic Conclusions

- Economic effects can be positive, negative or neutral.
- Influencing economic effects:
 - Value of catch: productivity; size; distribution; markets?
 - Production costs: new investment; energy consumption?
 - Employment: degree of specialization, alternatives?
 - Distributional effects: redistribution of benefits and costs?
 - Community economies: loss of infrastructure? diversified base?
 - Long-term profitability: able to account for range of possibilities?

Economic Effects of Climate Change

Key Economic Conclusions

- Economic effects don't exist in isolation:
 - Layered on existing economic and governance conditions: Overcapacity? Full utilization? Governance effectiveness?
- Vulnerability to economic effects is affected by:
 - level of exposure to change
 - sensitivity to change
 - level of fishery dependence
 - response capacity

Climate Change Effects on Governance

Governance: system of contractual relations and decision processes.

Governance influenced by

- economic status of fishery
- economic uncertainty and regulatory design
- transactions costs
 - allocation
 - conflict resolution



Governance Effects of Climate Change

Key Governance Conclusions

- Governance has multiple functions: maintain biological sustainability, economic viability, decision stability, while also adapting to change.
- There is an inherent contradiction between stability and flexibility.
- Managing portfolios of fisheries (EAF) may promote more resilience than managing specialized fishery units.

Policy Responses to Climate Change

Policy sends guidance and directives to governance to influence fishery outcomes: promote the resilience and adaptive capacity.

General policy options

- mitigation
- adaptation

The timing of policy action is a matter of benefits and costs.



Seafood Producer's Cooperative

Policy Responses to Climate Change

Addressing Economic Impacts: What should policy do?

A range of policy options:

- Basic research: uncertainty about human systems
- Stakeholder engagement: literacy and capacity
- Risk assessment: risk reduction
- Strategic planning: expanding policy frameworks
- Cross-sector coordination
- Market-management integration: strengthening linkages
- Regulatory control: adopting flexible management

Economic, Governance and Policy

The inherent challenges:

- Incorporate uncertainty of a new range of conditions
- Maintain a workable balance between stability and flexibility



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