# The TASC (Total Allowable Scallop Culture)

## an approach for the issue on the overproduction in Yezo giant scallop cultivation in Mutsu Bay

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PICES Session7 oct.26 (Portland)

# What is TASC?

**Meaning**

Initial of [Total Allowable Scallop Culture]

(Original word of "Mutsu Bay" in Aomori prefecture)

**Contents**

① Background about TASC

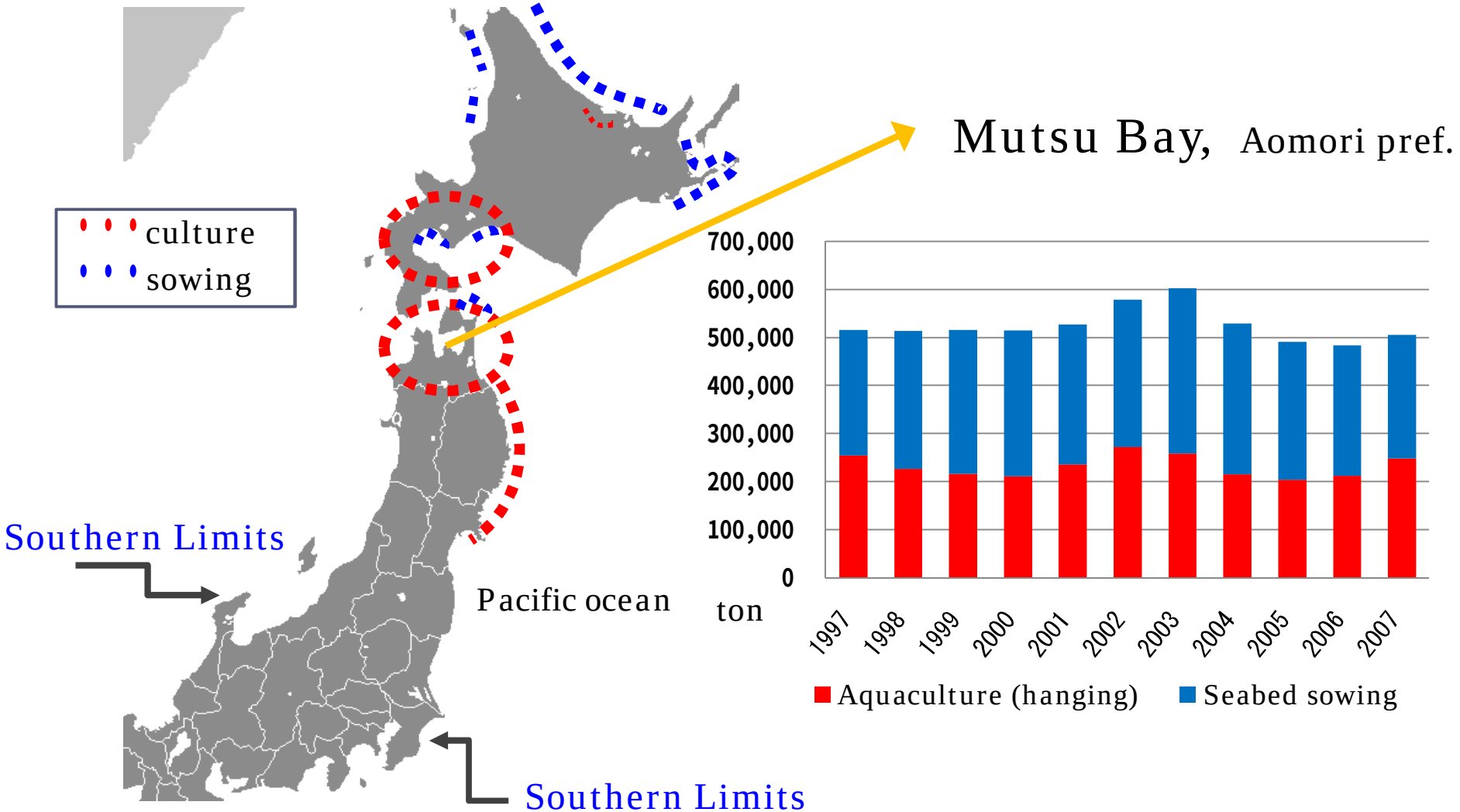
② Eestimate of cultivation quantities [from Feed / Income ]

③ Coordination for agreement in stakeholders

1,291 fishers and processors

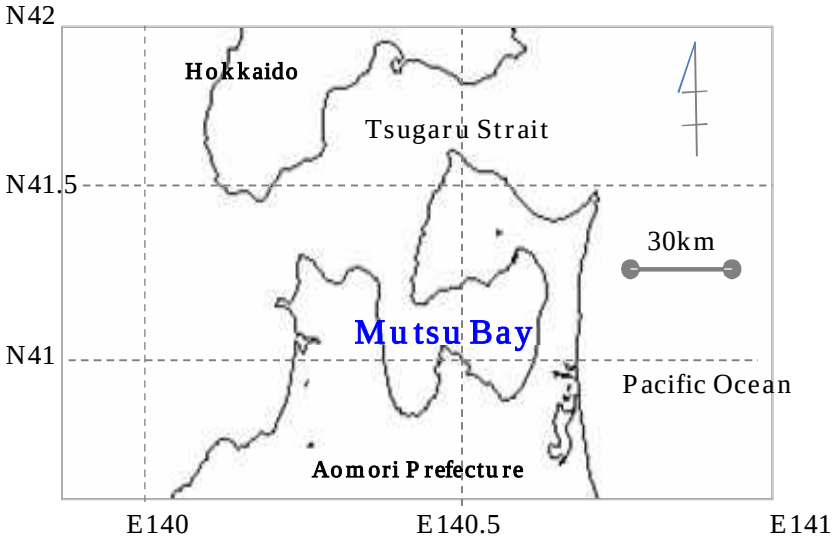
# Yezo giant scallop aquaculture in JAPAN

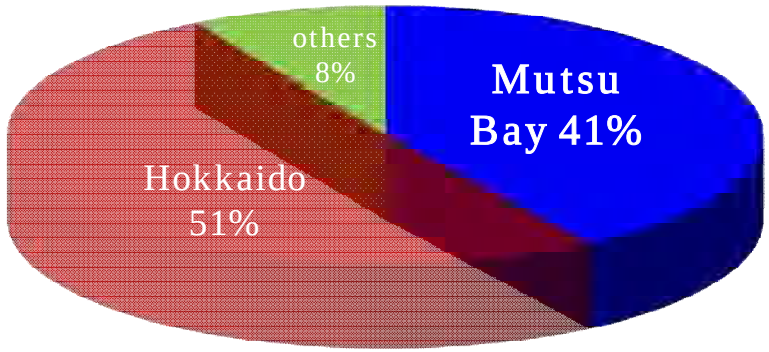
## [type of aquaculture / distribution map]

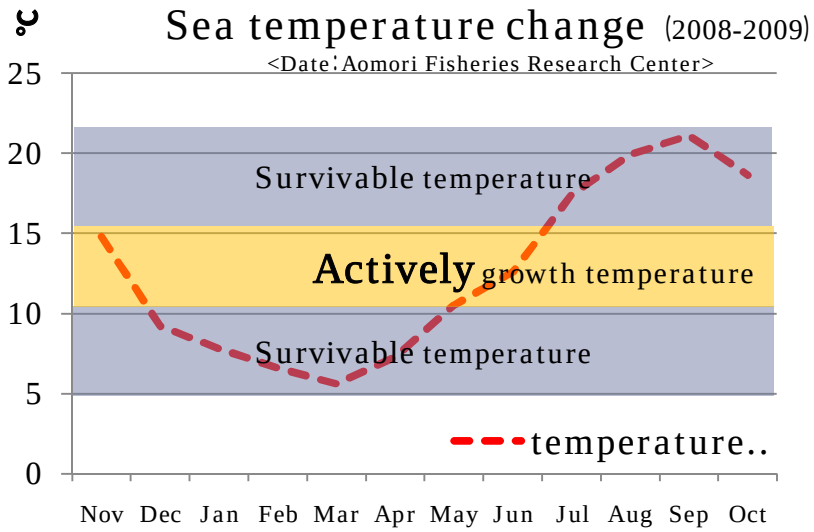


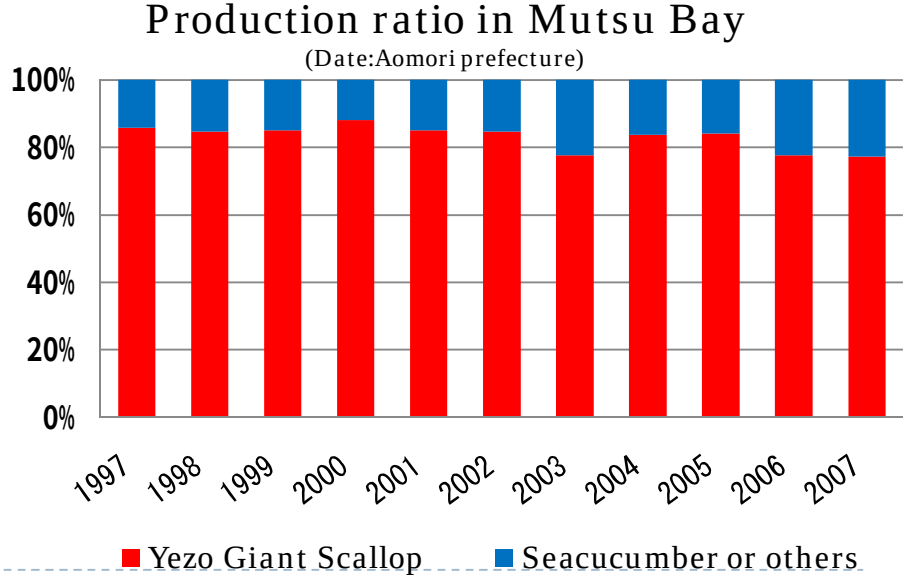
# Yezo giant scallop aquaculture in Mutsu Bay

## [Map / Temperature / Aquaculture ratio / Species ratio]

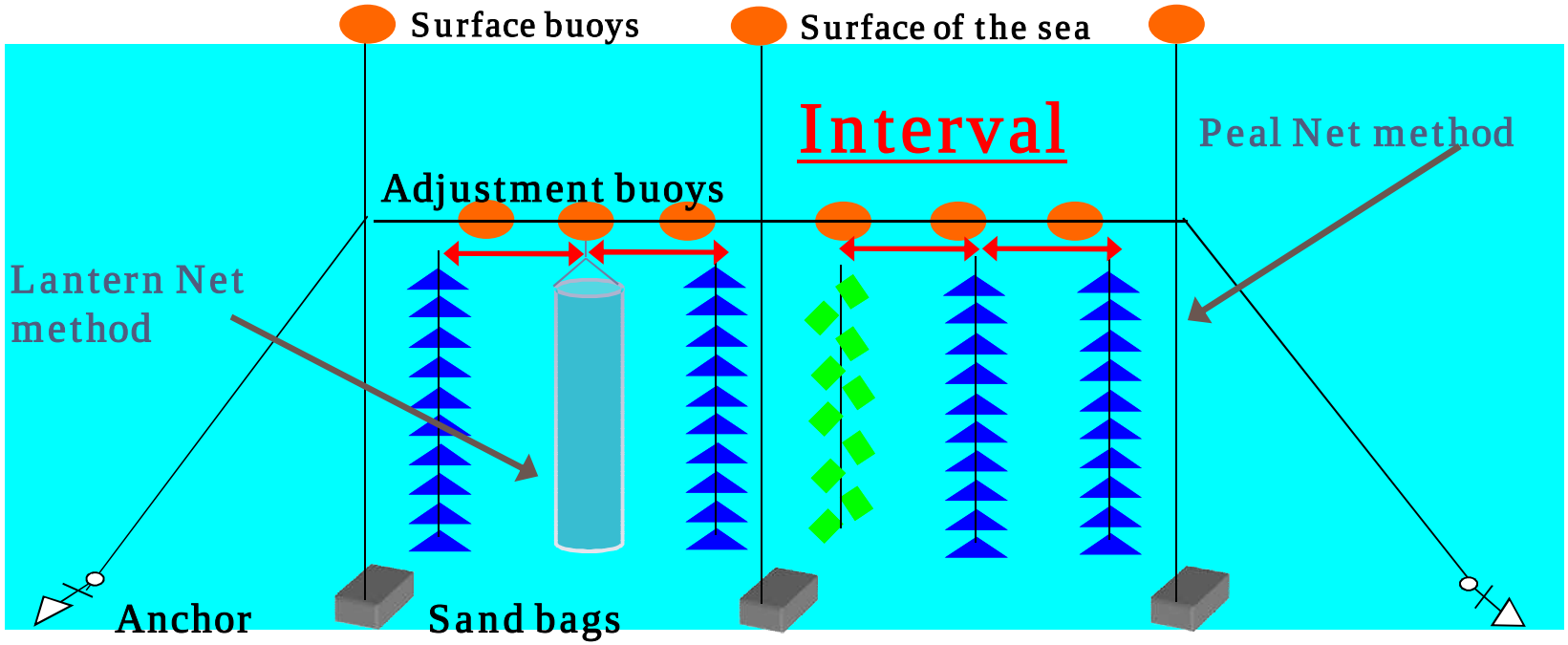


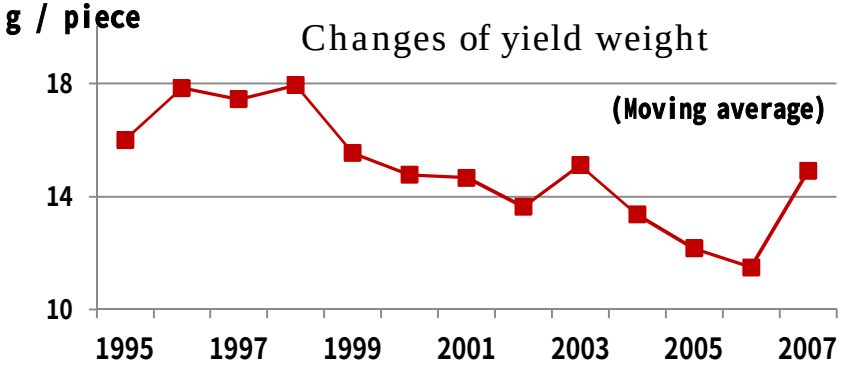



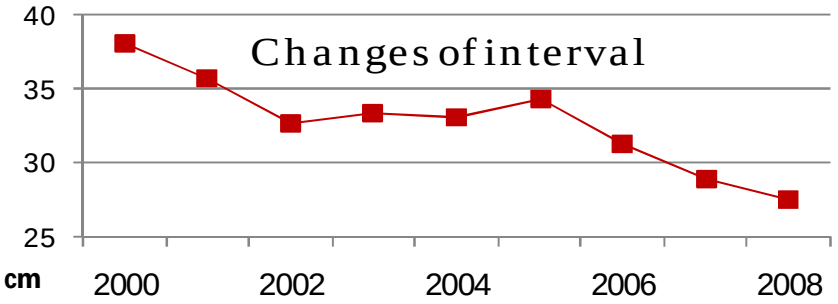



# Yezo giant scallop aquaculture in Mutsu Bay
## [Over cultivation, Low income and Low quality]



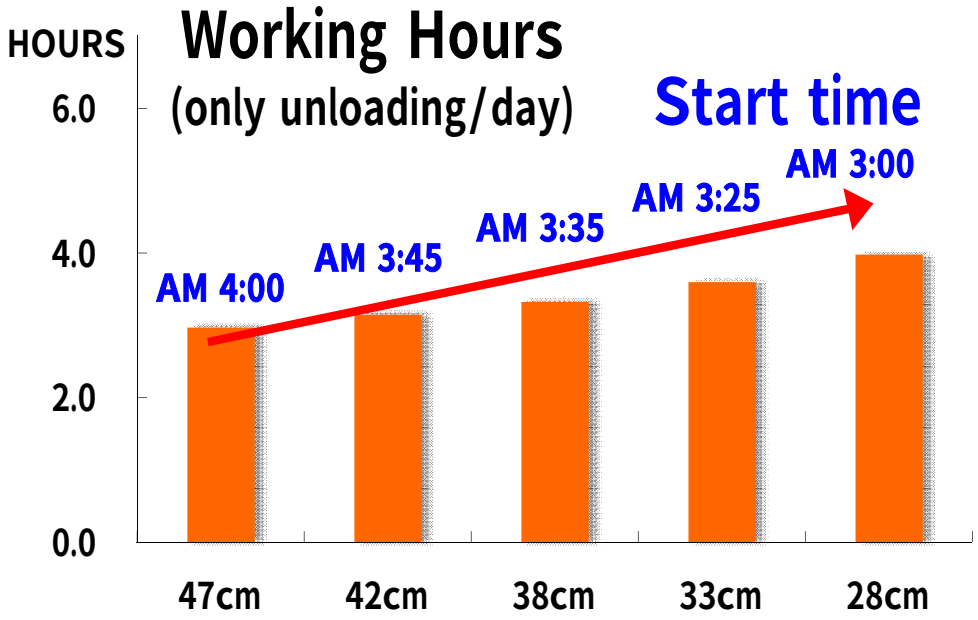




(Date: Aomori Prefecture Fisheries Research Center Aquaculture Institute)

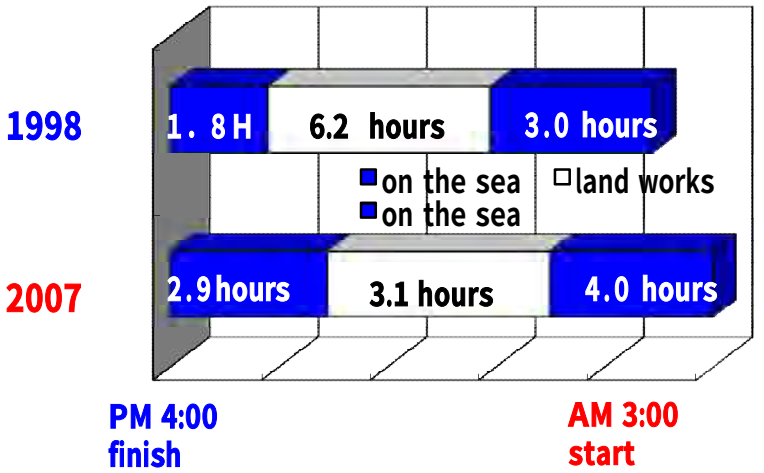
# Overworking on the sea

## [Over cultivation caused the over work ] in Mutsu Bay




Interval of hanging facilities

DATE : From TASC investigation (HIROTA, 2007)



# Yezo giant scallop aquaculture in Mutsu Bay
## [Over cultivation also led mother scallop shortage]

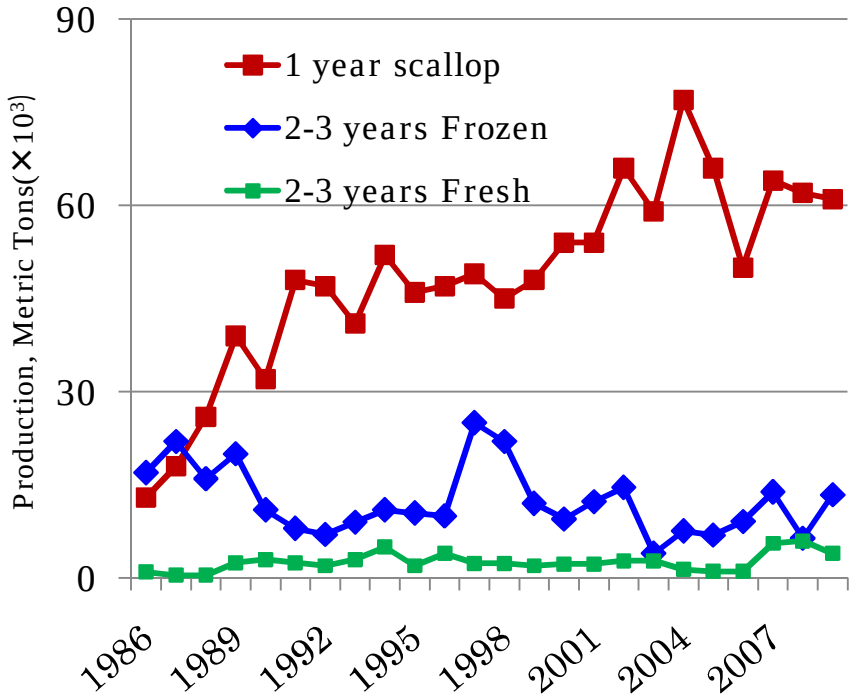



Fig. Changes in annual processing production of each scallop size and age
:Aomori Fisheries Cooperative Association survey

| Processing | Hanging term(years) | Shell length | Sexual mature |
|---|---|---|---|
| Boiled | 1～1.5 | 7～9cm | × Low |
| Frozen | 2～2.5 | 11～13cm | ○ High |
| Fresh | 2～2.5 | 11～13cm | ○ High |

Managerial efficiency : **High**

Re-productivity: **Low**

# Summary of issue to be solved
[:in Mutsu Bay scallop cultivation Industry]

1. Quality loss and unstable of management
2. Overworking on the sea
3. Re-production loss from mother scallop lack

Quality loss

Overwork on sea

Mother scallop lack

# TASC is composed of two analysis
## [:Feed environment / management simulation]


TASC quantity


① Analysis of proper production

**Feed environment**

1) primary production
2) inflow of organic substances

② Calculation of proper production

**Income and cost simulation**

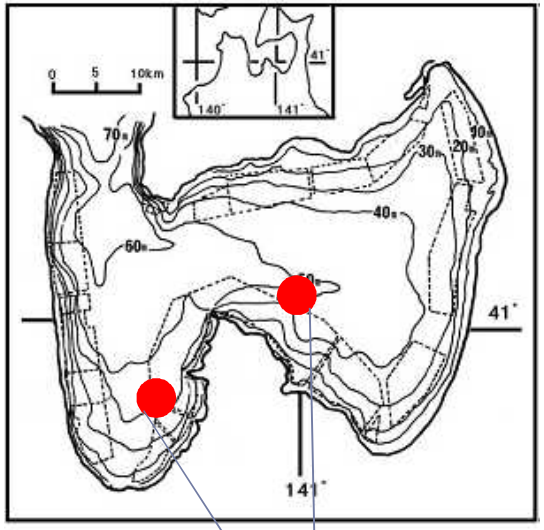
1) price function
2) cost analysis

# Analysis of proper production from feed
# Primary production quantity

① Analysis of proper production

**Feed environment**
1) primary production
2) inflow of organic substances

→ Research and analysis of Feed account balance




Research site

Scallop culturing capacity in Mutsu Bay

million pieces

| | | aquaculture | | sowing | | total |
|---|---|---|---|---|---|---|
| | | juvenile | adult | juvenile | adult | |
| status | 2 years shell | 748 | 342 | | | |
| | 1 year shell | 483 | | 140 | 163 | |
| | total | 1,573 | | 303 | | 1,876 |
| simulatio | 2 years shell | 496 | 236 | | | |
| | 1 year shell | 328 | | 140 | 163 | |
| | total | 1,060 | | 303 | | 1,363 |

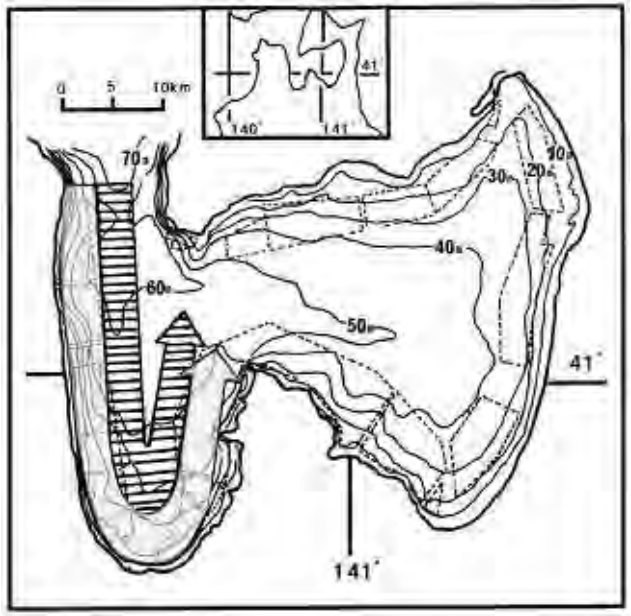
Yoshida, Kosaka (2002) Aomori Fisheries research center Aquaculture Institute

# Analysis of proper production from feed Inflow organic substances

① Analysis of proper production

**Feed environment**
1) primary production
2) inflow of organic substances

Total Allowable Scallop Culture capacity
83,711(ton )+5,860(ton)=89,571(ton)
Primary Inflow



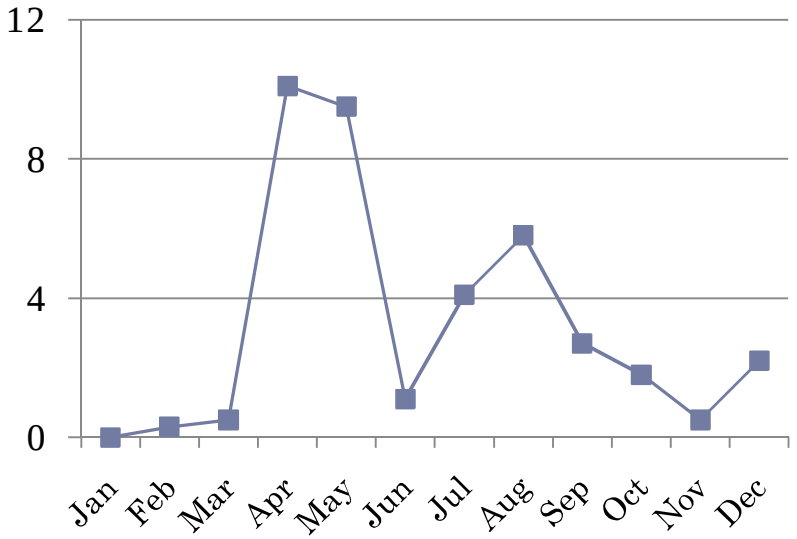




Fig Rate of inflow organic and primary production

TASC system report 2009:Aomori Prefecture Fisheries Institute)

# Calculation of proper production from management
## Production function

**Income and cost simulation**
1) Production function
2) Cost analysis

→ Analysis of correlation production quantities and each Price

Result of Multiple regression

| | | Juvenile | Adult | Sowing |
|---|---|---|---|---|
| Partial regression coefficient | Aomori production | -0.00269 | -0.00080 | - |
| | Hokkaido sowing | - | -0.00054 | -0.00124 |
| | Hokkaido hanging | - | -0.00077 | - |
| | Adult production | - | - | -0.00351 |
| Fitting | constant | 388.559 | 474.868 | 557.938 |
| | Adjust $R^2$ | **0.91987** | **0.8854** | **0.7816** |
| | SE | 5.8023 | 8.3085 | 13.6774 |

Juvenile / Adult / Sowing → Dependent variable

✕ Production quota (variable)

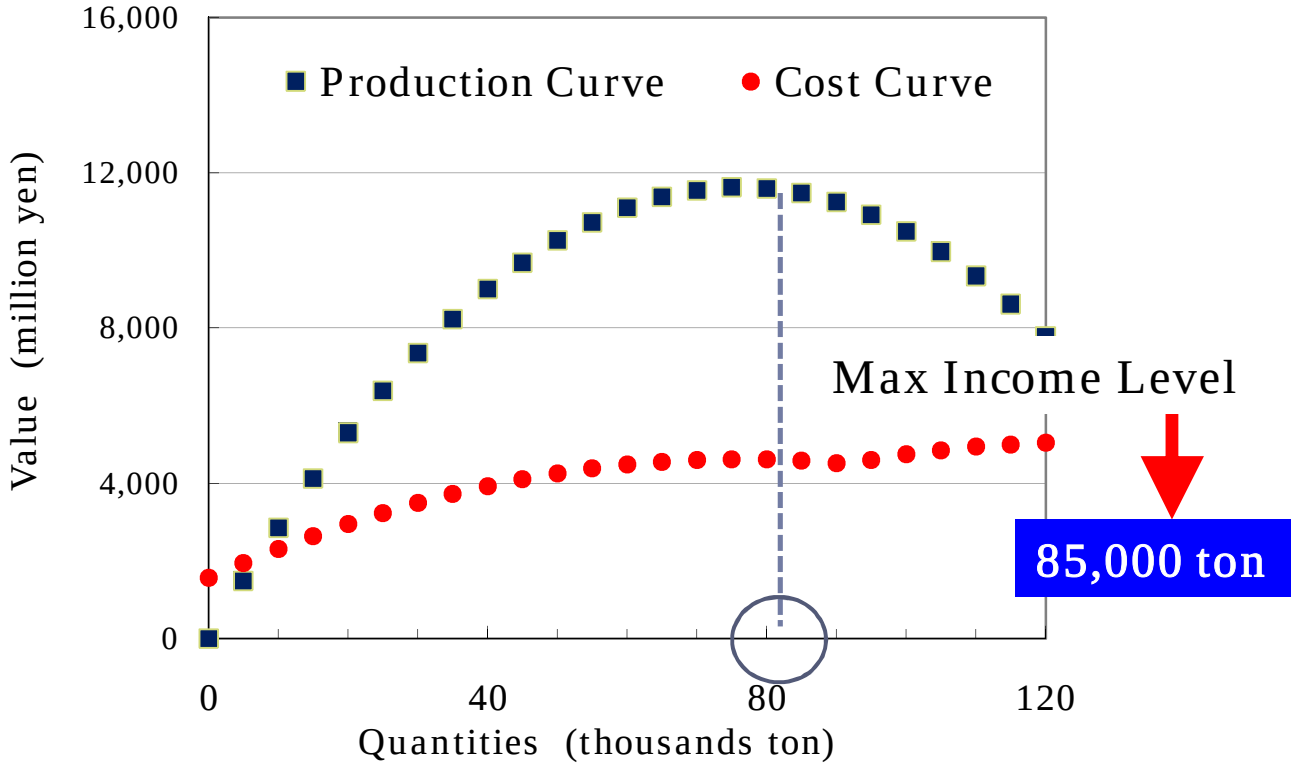
=Total quantity simulation

TASC system report 2009:Aomori Prefecture Fisheries Institute)

# Calculation of proper production from management
## Cost Analysis

**Earning and expensive simulation**
1) Production function
2) Cost analysis

→ Analysis of cost curve




TASC system report 2009:Aomori Prefecture Fisheries Institute)

# Process to agreement for stakeholders

2007.5～2008.4

Meeting 23times

Reserchers

Prefectural government

Fisheries cooperative Association

Sectional meeting

2008.4～2008.6

Meeting 20 times

20 Fisheries cooperative Association

Participants : 840 peoples

All concerned : 1,291 entrepreneurs

Implemented in 2010. Feb

## Term of agreements

| | |
|---|---|
| Total quantities (ton) | 90,000 |
| Adult scallop (ton) | 20,000 |
| Shift period | 2 years |
| distribution rate | X |

TASC system report 2009:Aomori Prefecture Fisheries Institute)

# Summary

1 TASC has bio and economic grounds
[ Feed environment,/income and expense balance]

2 Implementation on Exercise Regulation for Fishery Right

Fisheries Cooperation
applying ⇩ permission
government

2010 Feb start