INTRODUCTION

FEEDBACKS FROM FILTER FEEDERS:
ROLE OF BIVALVES IN CYCLING AND STORAGE OF NUTRIENTS

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What is “Bivalve nutrient cycling”

Bivalves as intermediates in nutrient cycling

**Phytoplankton**
- Negative feedback

**Inorganic nutrients**
- Positive feedback

**Mussels**
- Mineralization

**Biodeposits**

Primary production
Fjord systems:
- Low nutrients
- Sink for nutrients
- Retention needed for productive mussel culture
Nutrient (N) regeneration through mussels: mineralization up to 40 % of total N regeneration

Increased phytoplankton turnover after completion of the Oosterschelde barrier

Maintenance of primary production

→ positive feedback
UNDER OR OVERGRAZING

Undergrazing = grazing at which primary production is stimulated by biomass increase

Overgrazing = grazer biomass that limits primary production
High grazing pressure of phytoplankton will stimulate other primary producers that escape from grazing such as picoplankton (Cranford et al, 2010)

→ negative feedback

Research item Wadden Sea and Oosterschelde:

SEE: van Broekhoven & Jacobs
What is “Bivalve nutrient storage”

Accumulation of nutrients in bivalve tissue

Phytoplankton → Inorganic nutrients

Mussels

Accumulation

Biodeposits

Primary production

Filtration

Excretion

Mineralization
EXCESS NITROGEN REMOVAL THROUGH EXTRACTION

SEE:

paper of

Jens Petersen
INTEGRATED MULTITROPHIC AQUACULTURE

IMTA “Zealand Sole”

Combined pond culture of Ragworm, Sole, Algae, Bivalves Salicorn, Seaweed

Nutrient input though feed is compensated by extraction of nutrients in biomass
## Ecosystem Services Provided by Shellfish

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