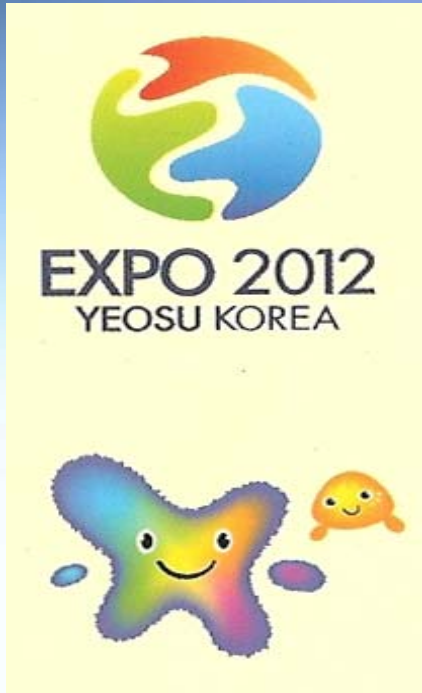




# IMTA PROPOSITION IN YEOSU EXPO. 2012.

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### Symbol

Represents the harmony of the ocean and the earth

### Mascots

Yeosu-rnag, was modeled after the geographical features of Yeosu. It expresses the harmonious ecosystem and diverse culture of Yeosu

### Global Festival!

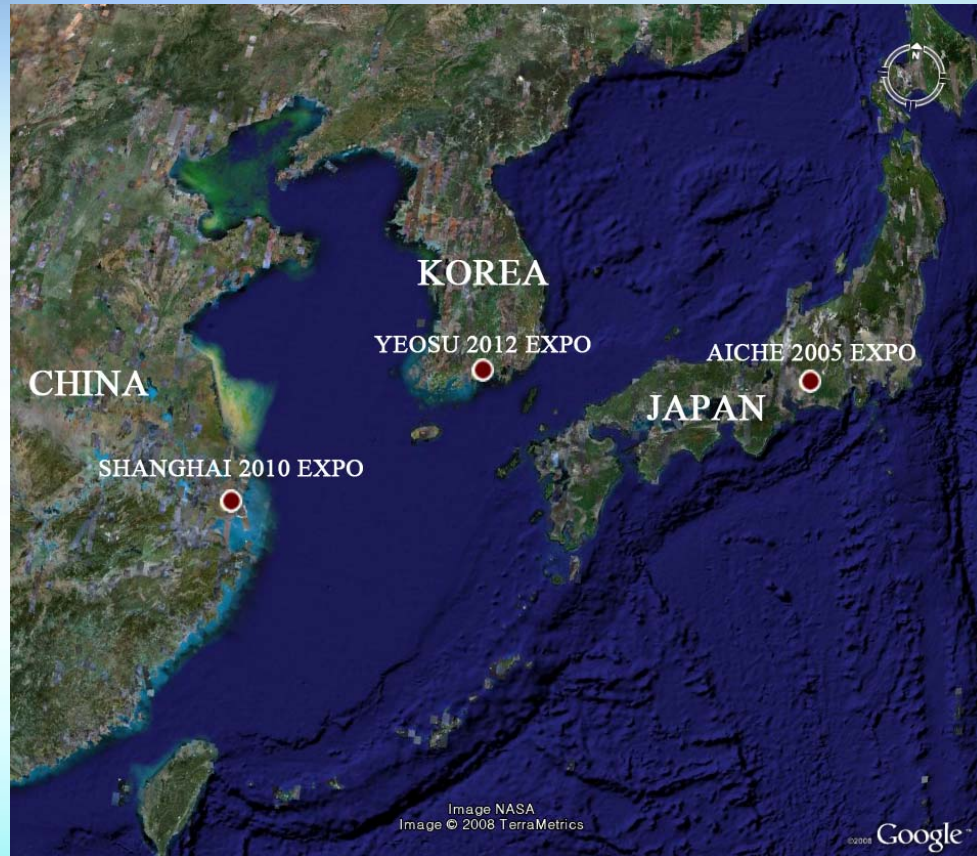
Title : International Exposition Yeosu Korea 2012

Period : May 12 – August 12, 2012 (3 months)

Place : New Port Area, Yeosu, Jeollanamdo(1,735 thousand m<sup>2</sup>)

Slogan : "The Living Ocean and Coast"

# Meaning of YEOSU EXPO

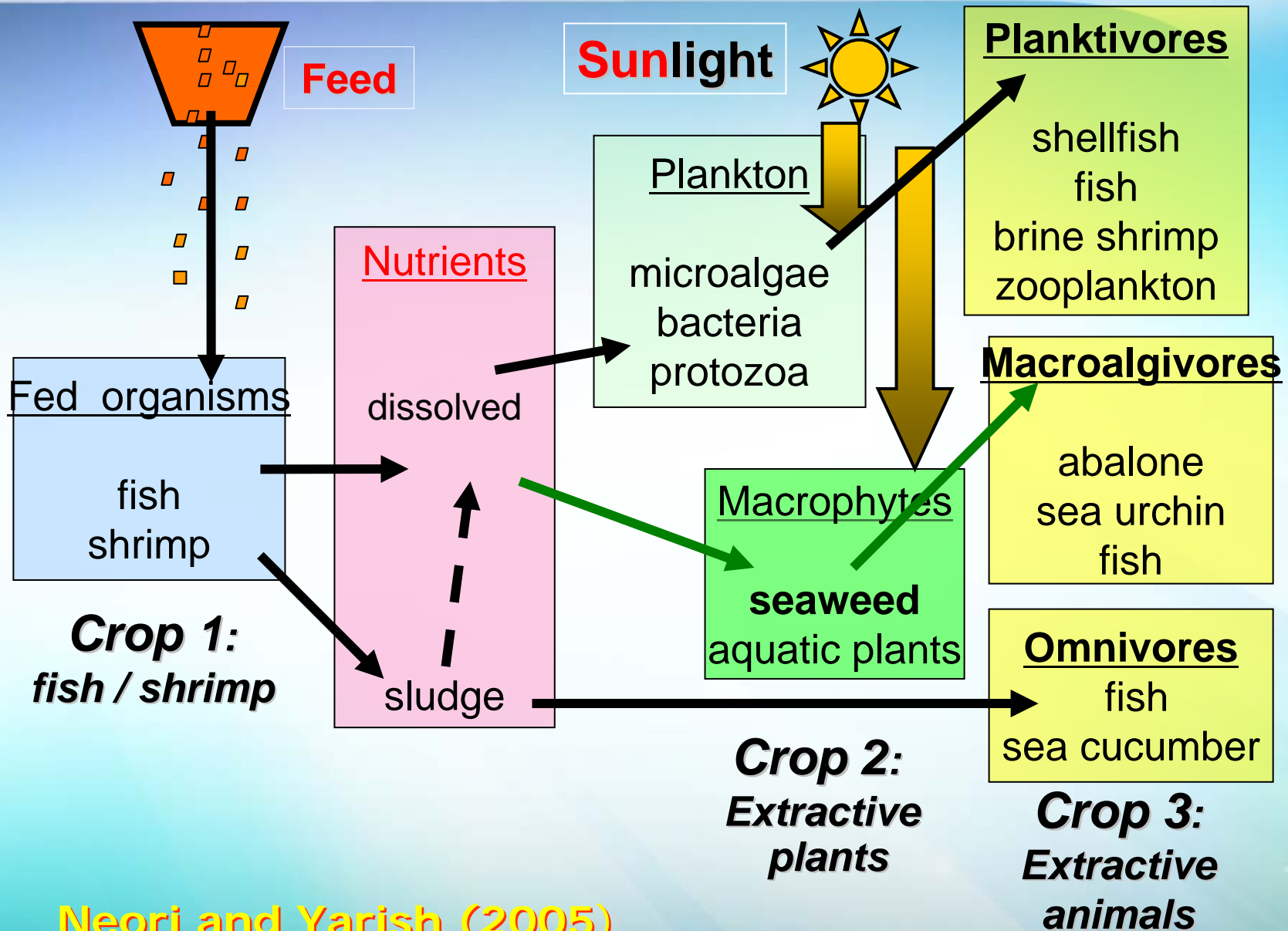


- The first point – the whole world’s attention and concern will be attracted to the North-east Asia.
- The second point – Yeosu EXPO will be the first EXPO in the theme of the marine and environment , many events about various fields of ocean and coast will take place.

# Events of YEOSU EXPO

- Coastal CO<sub>2</sub> Removal Belt
- Promotion of marine forest
- Intergrated Multi-Trophic Aquaculture (IMTA)

# Aquaculture with Low Pollution (Integrated Multi-trophic Aquaculture, IMTA)



Neori and Yarish (2005)

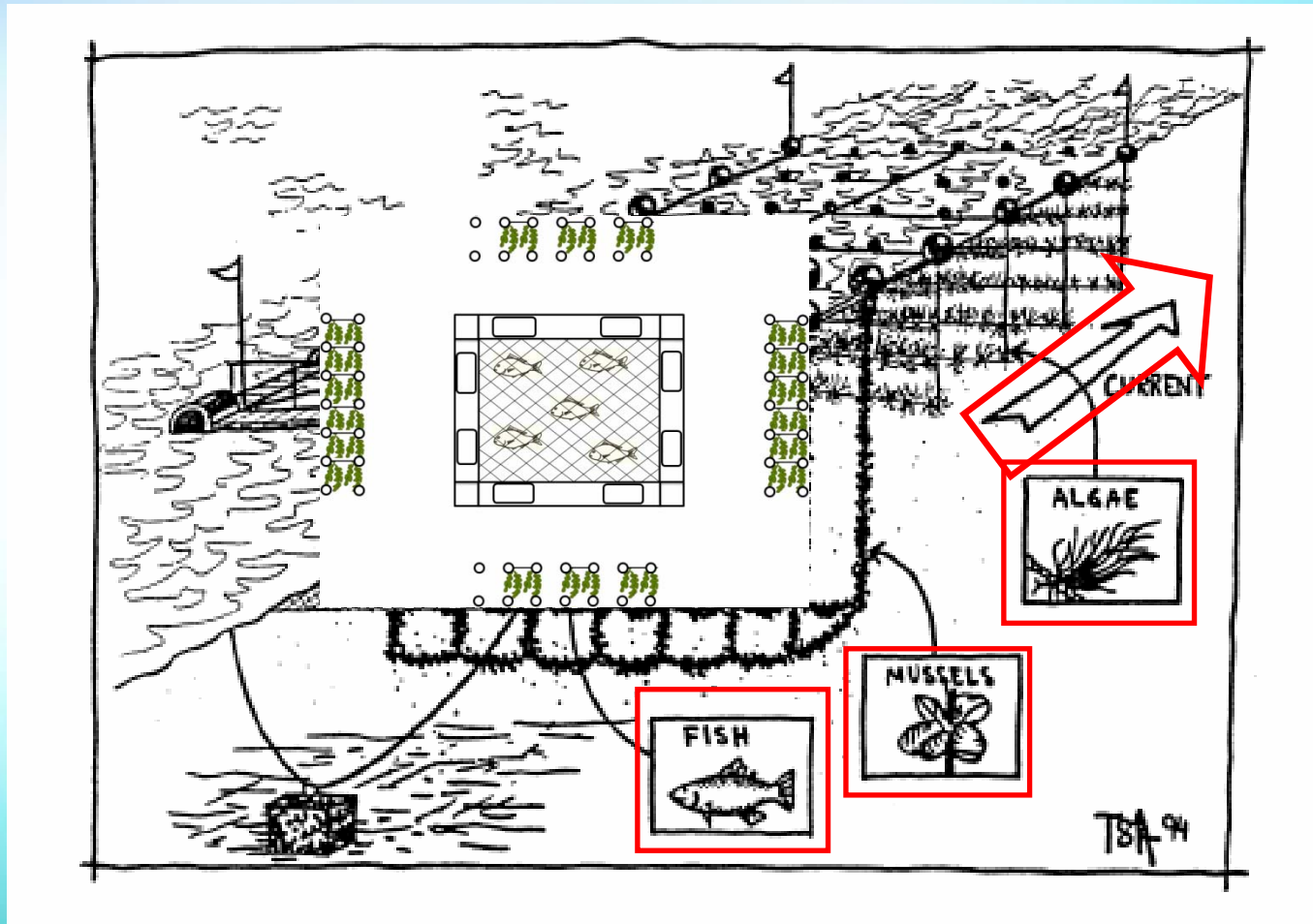
# Intergrated Multi-Trophic Aquaculture (IMTA)

## Feed Aquaculture + Extractive Aquaculture

(finfish)

organic  
(shellfish)

Inorganic  
(seaweeds)



(Troell and Norberg 1998)

# Intelligence of fishermen



DolSna-do Yeosu  
Aquafarm

- **The integrated multi-trophic aquaculture (IMTA) concept and its development in the Bay of Fundy, Canada**
  - Chopin T., Shea R., Sawhney M., Campbell E., Belyea E., Bastarache S., Armstrong W., Sewuster J., Ugarte R., Watson P., Wilcox T., Szemerda M., Marvin R., Powell F., Holland M., Reid G.K., Robinson S.M.C., Ridler N., Page F., Haya K., Burrridge L., and Boyne-Travis S.
- **Traditional vs. integrated aquaculture of *Gracilaria Chilensis*: productivity and physiological performance (Chile)**
  - Abreu M.H., Varela D. A., Henriquez L., Yarish C., Sousa-Pinto I. & Buschmann A. H.
- **Seabased IMTA: Modelling the fish to seaweed linkage (Scotland)**
  - Rodger A.N.S., Gillibrand P., Dring M. & Kelly M.S.
- **Bonnemaisoniaceae species as valuable candidates for fish/seaweed integrated aquaculture (Portuguese land based case study)**
  - Mata L. & Santos R.



- **Optimization of an integrated cod/nori recirculating aquaculture system** **(USA)**
  - Neefus C.D., Day J.P., Walker A.B., Berlinsky D.L. & Yarish C
- **An overview of NIWA's complimentary near-shore co-culture in **New Zealand****
  - Miller S.M. & Stenton-Dozey J
- **Integrated Aquaculture: A sustainable utilization of aquaculture localities for **Norway****
  - Reitan K.I.
- **A pilot scale integrated seaweed (*Ulva lactuca*) & abalone (*Haliotis midae*) recirculation system** **(South Africa)**
  - Robertson-Andersson D. V., Potgieter M., Hansen J., Bolton J. J., Troell M., Anderson R. J., Halling C. & Probyn T.

# Did you know?

Seaweeds can be made into...

## Foods/ Household Products

- Food thickening agents in ice creams, salad dressings
- Algin ingredients in some breads, beers, puddings and more
- Seaweed paper
- Seaweed extracts in some herbs and vitamins

## Bio-fuel & Paper

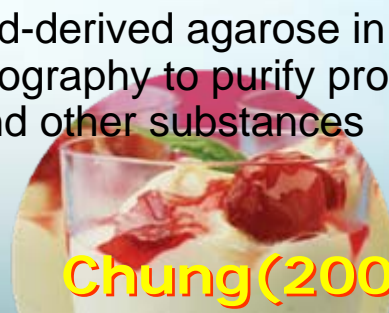
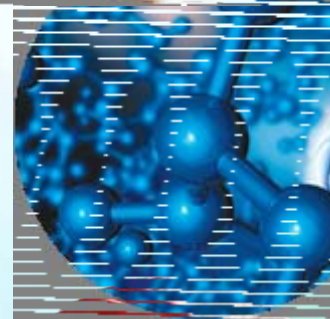
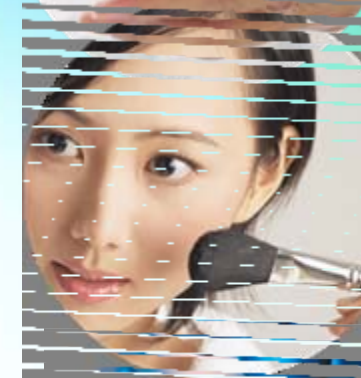
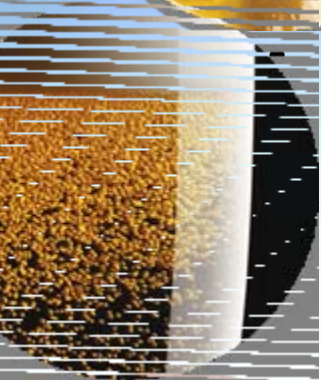
## Personal Care Products

- Algin ingredients in makeup, soap, toothpaste, and shampoo
- Seaweeds extracts in facial masques, massage gels, and bath products

## Medicines

- Seaweed ingredients in medicines used to treat tuberculosis, arthritis, colds, influenza and other infections
- Seaweed-derived agar, a substance used in the culture of bacteria and other microorganisms
- Seaweed-derived agarose in chromatography to purify proteins, DNA, and other substances

Chung(2007)





*Laminaria* 다시마



*Undaria* 미역



*Hizikia* 툃



*Ecklonia* 감태



*Sargassum* 모자반



*Porphyra* 김



*Gelidium* 우뚝가사리



*Gracilaria* 꼬사래기

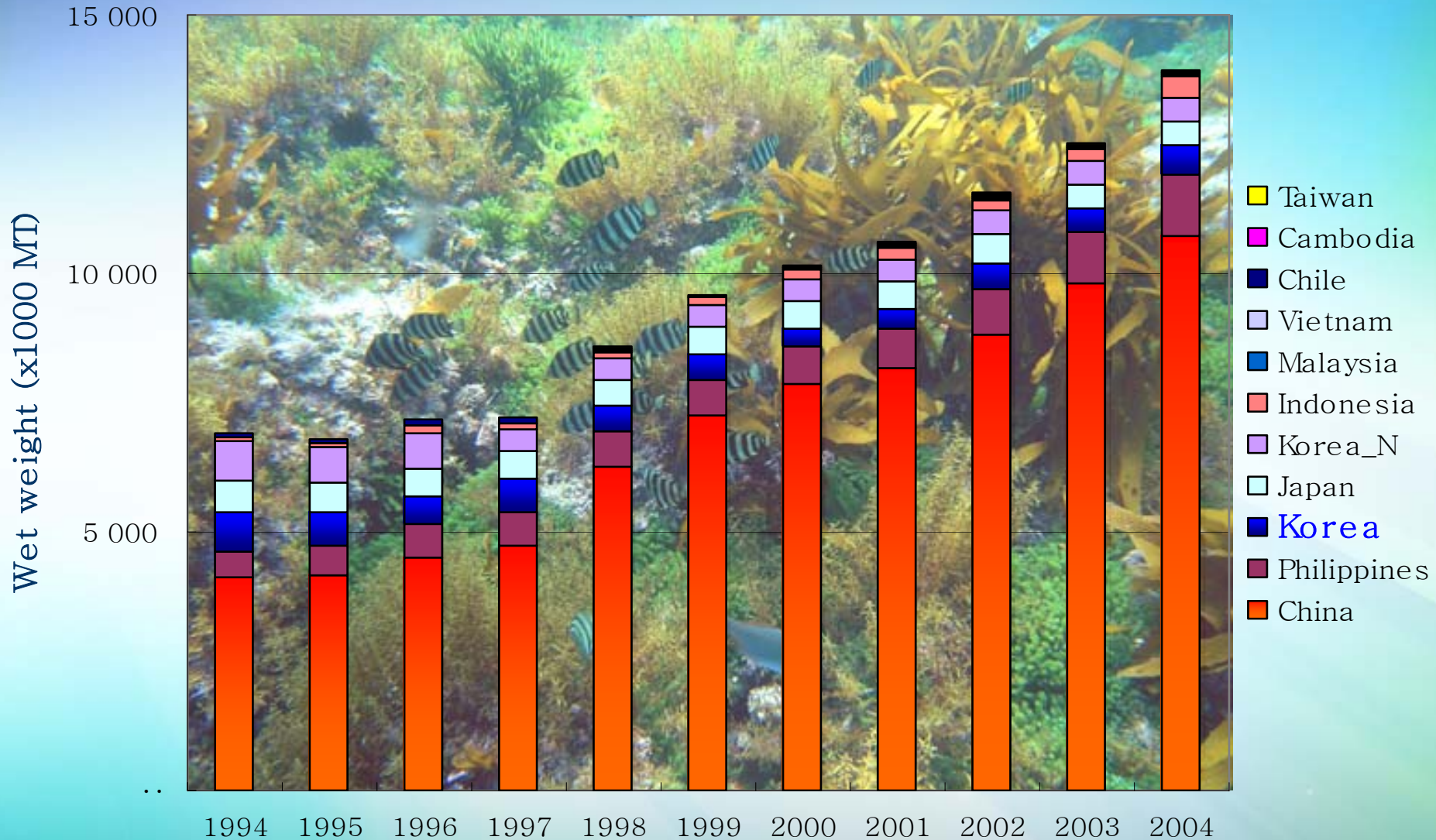


*Chondrus* 진두발

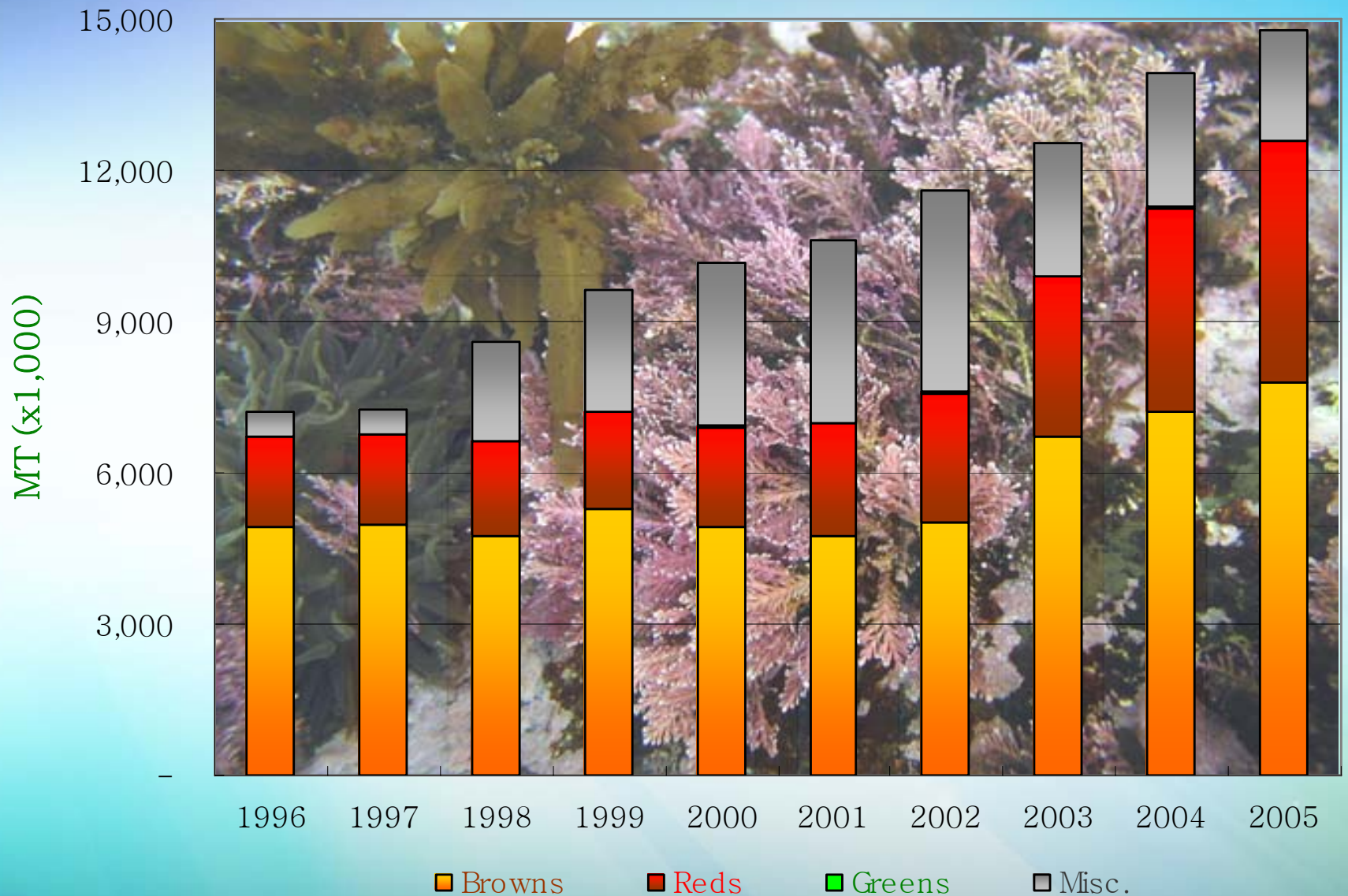


*Eucheuma* 유카이마

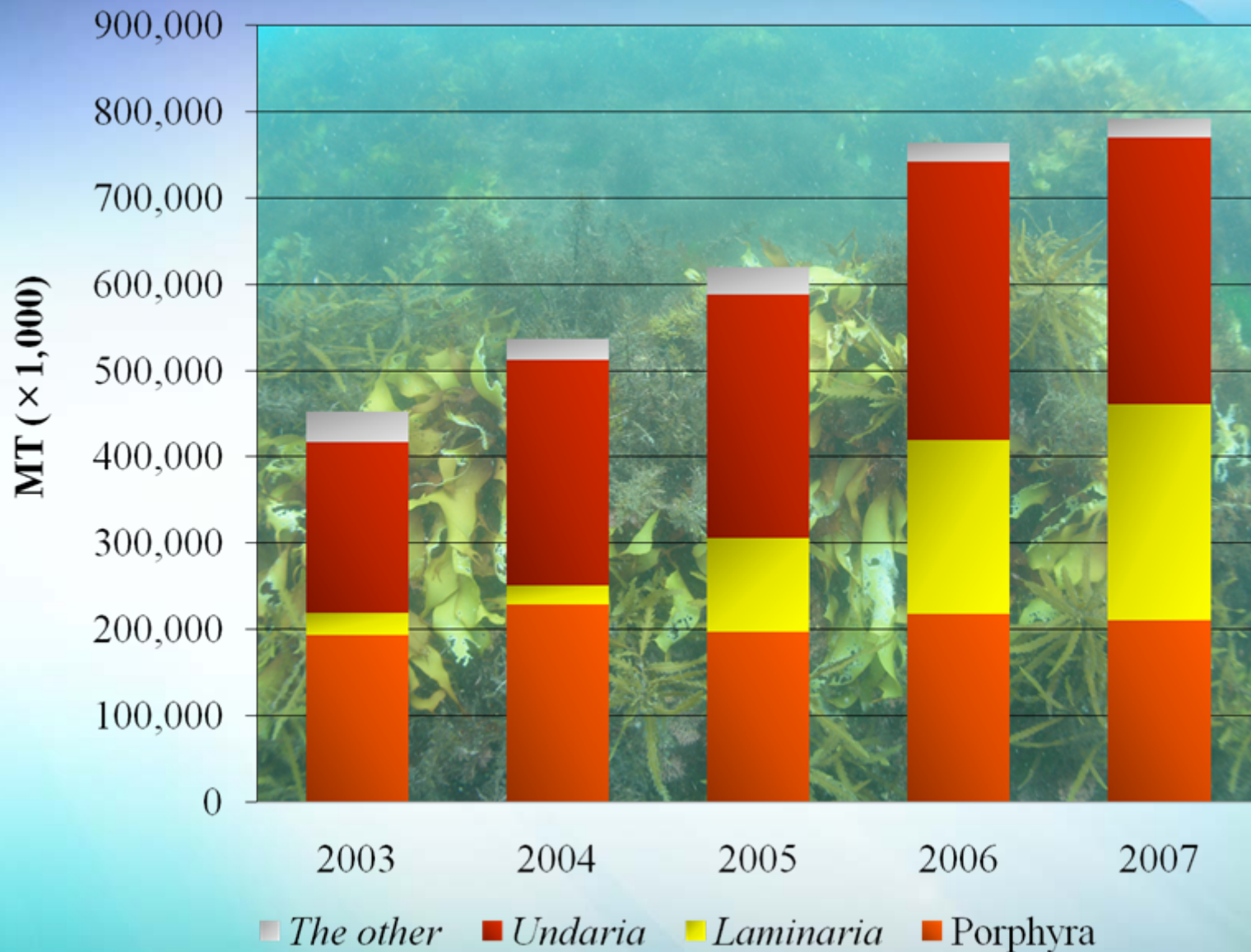
# World Seaweed Production



# World Seaweed Production (group) 2005



# Korean Seaweed Production (group) 2007



# Investigation of Cage-aquafarm(2005-2006) (Kang. 2008)



# Seaweeds used in IMTA

*Prophyra*

*Undaria*



*Laminaria*







*Hizikia*



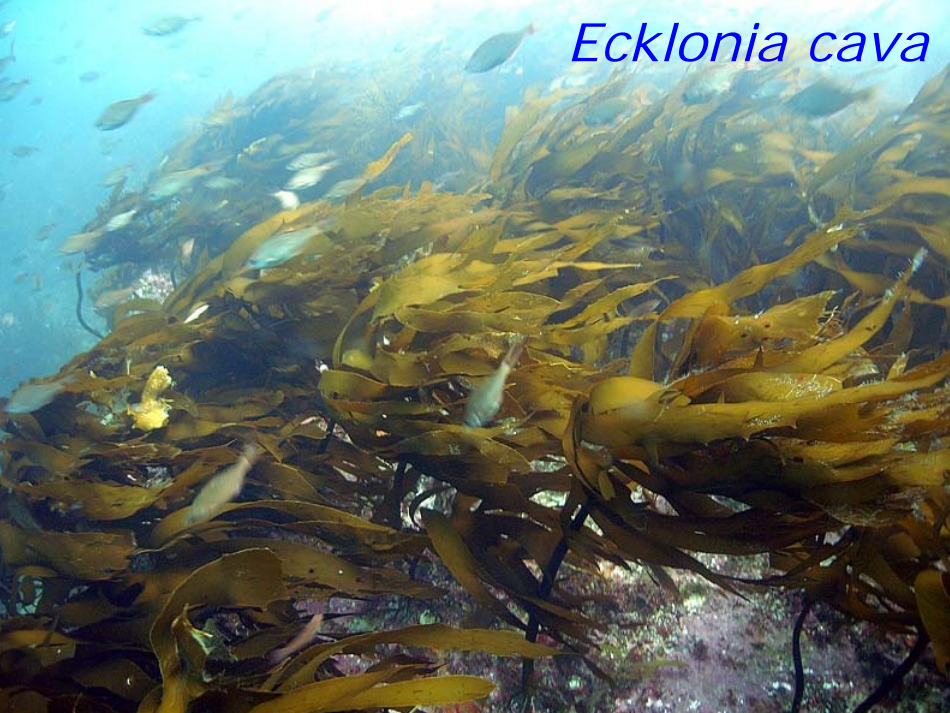
*Ecklonia cava*



*Codium*



*Sargassum*



*Ecklonia cava*



*Ecklonia stolonifera*

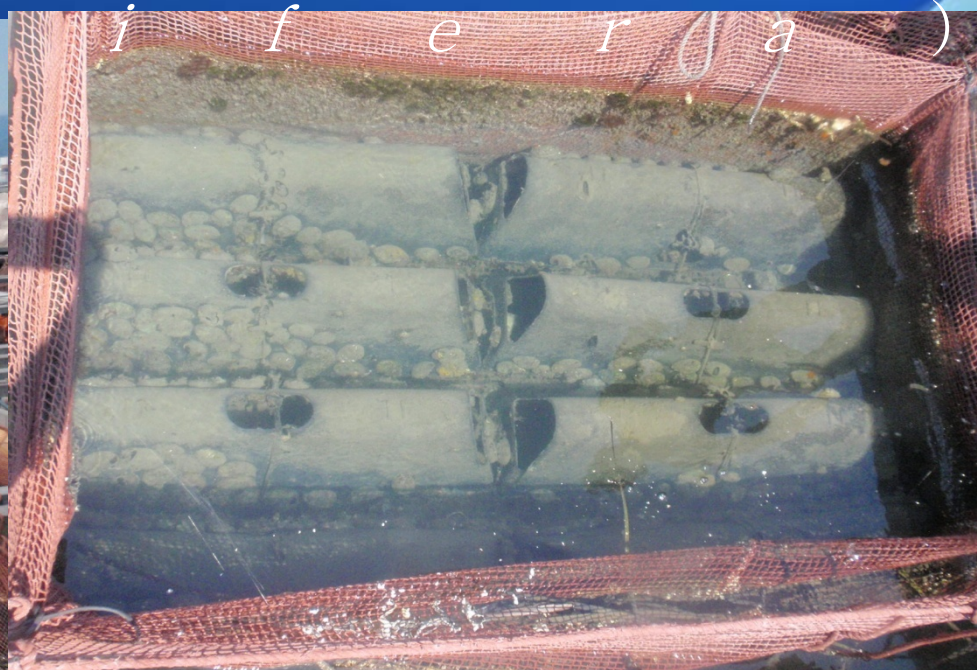


*Ecklonia Kurome*



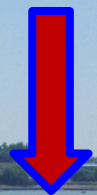
*Gelidium.*

# Model 1. Finfish+ Shellfish(Abalone)+ Seaweeds(*Ecklonia*



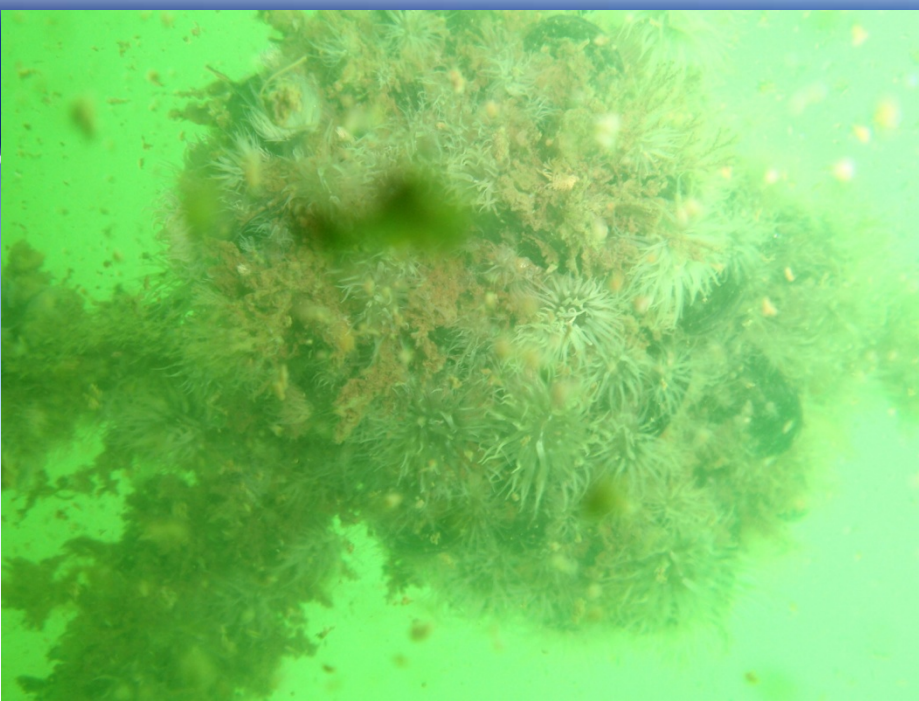


Bird shell +  
*Zostera marina*,  
*Ecklonia stolonifera*



# Model 2. Finfish+Shellfish(blue mussels)+Seaweeds(*Codium*)





**THANK YOU FOR  
YOUR ATTENTION**