Asia-Pacific
Economic Cooperation

2014/SOM2/OFWG/031
Agenda: IV B 5

Report on progress of APEC Ocean and Fisheries Information Center (AOFIC)

Purpose: Information
Submitted by: Indonesia

APEC
CHINA 2014

3rd Ocean and Fisheries Working Group Meeting
Qingdao, China
9-12 May 2014

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OCEAN AND FISHERIES INFORMATION CENTRE

prepared by:

Indonesia

Ocean and Fisheries Working Group
Qindao, 11 May 2014

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Background

- Following previous APEC Ocean and Fisheries Working Group meeting in 2013, we report the progress of self funded project: **APEC Ocean and Fisheries Information Center [AOFIC]**
- This center will support some Regional Fisheries Monitoring Centre within this region
- The vast array of databases is already exist, but sometimes difficult to access
- A series of actual and updated data and information will be delivered for science and policy making process

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The APEC Ocean and Fisheries Information Center has function to

- Supply information to OFWG on the current status / outlook on Marine and Fisheries condition
- Provide services to Fisheries Monitoring Centre in the region
- Provide facilities for training and education on marine and fisheries data analysis (e.g. using remote sensing imagery, oceanographic data & modeling, etc.)
- The location of this center is at Perancak, Bali – Indonesia

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Organization Structure of Institute for Marine Research and Observation

Ministry of Marine Affairs and Fisheries

Agency for Marine and Fisheries Research and Development

Research and Development Center for Marine and Fisheries Technology

Institute for Marine Research and Observation

Institute for Marine Research and Observation (IMRO) was founded on August 29, 2005.

IMRO has a mandate to conduct research and observation related to marine resources, i.e. physical and chemical oceanography, potential fishing ground area, and climate change.

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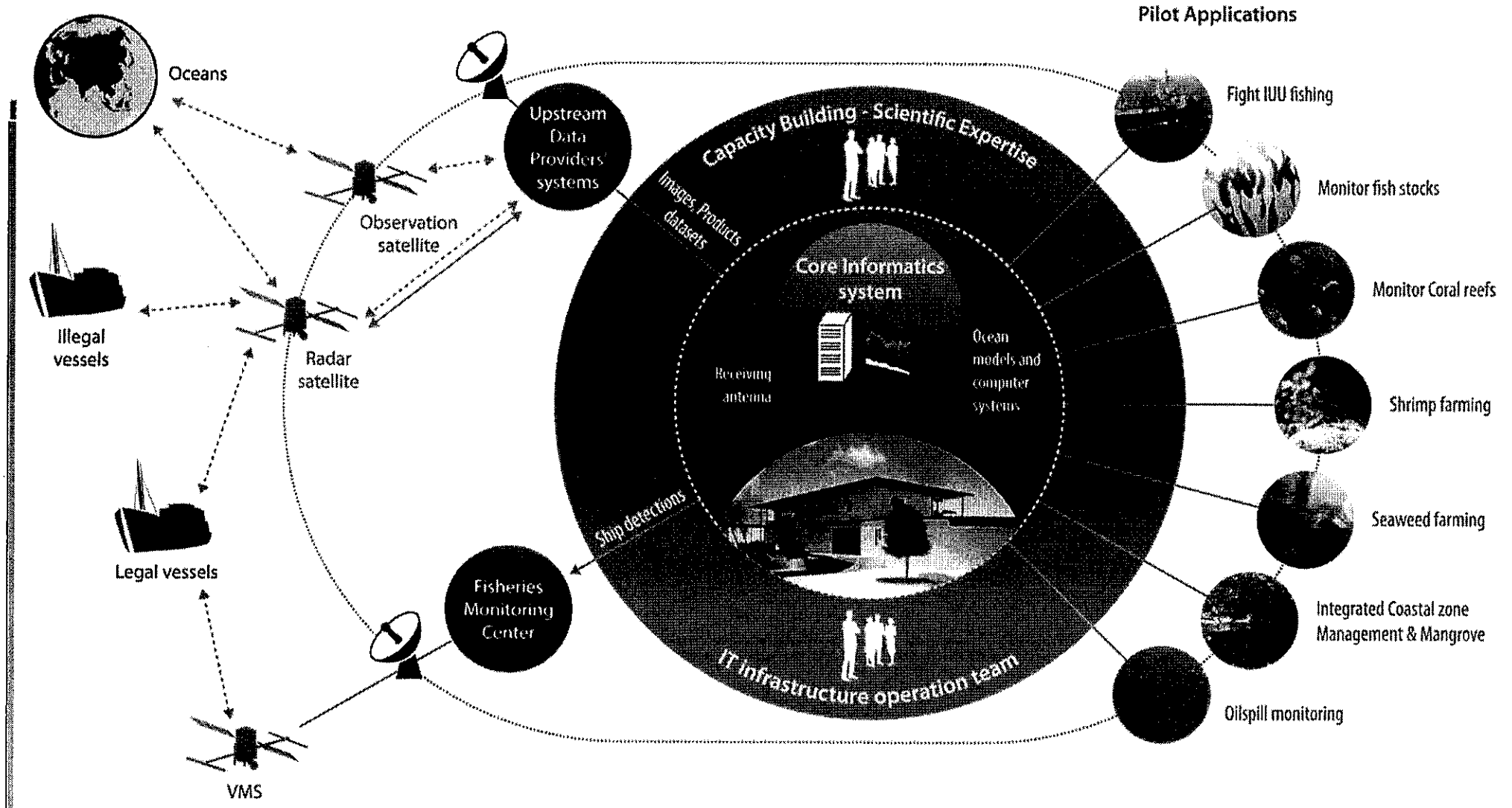
Balai Penelitian dan Observasi Laut



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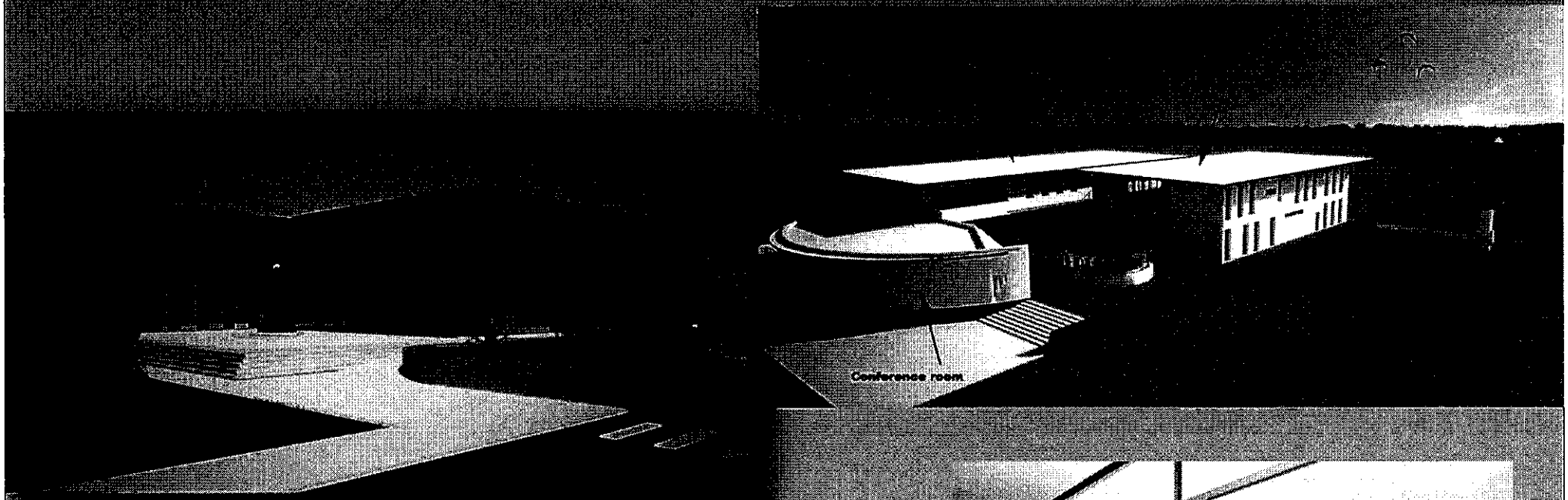
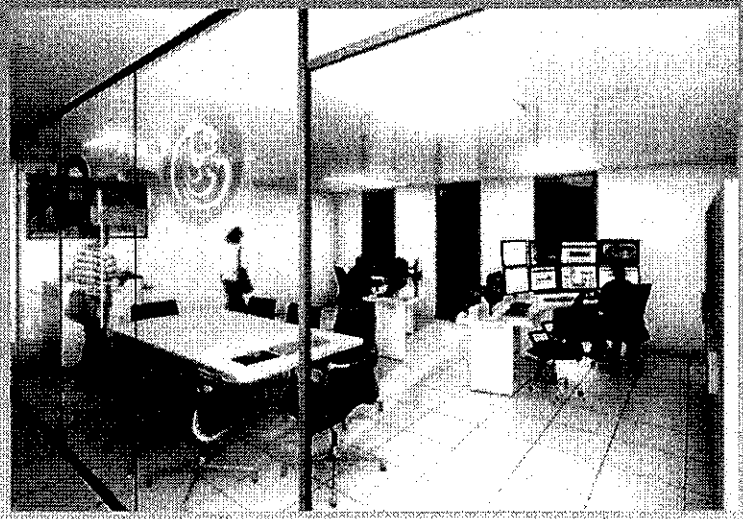
ARCHITECTURAL DESIGN OF APEC OCEAN & FISHERIES INFORMATION CENTER

AOFIC - Operational Center



- Hosts the APEC OFIC Core System and operational/scientific teams
- Located in Perancak - Negara, Bali



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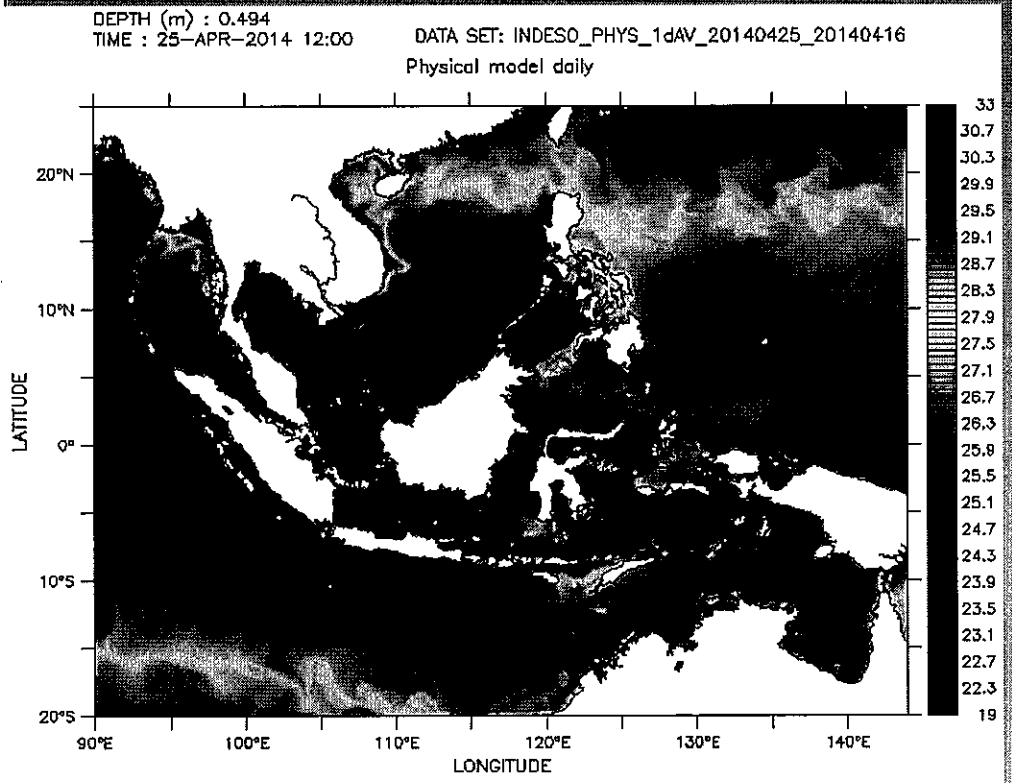
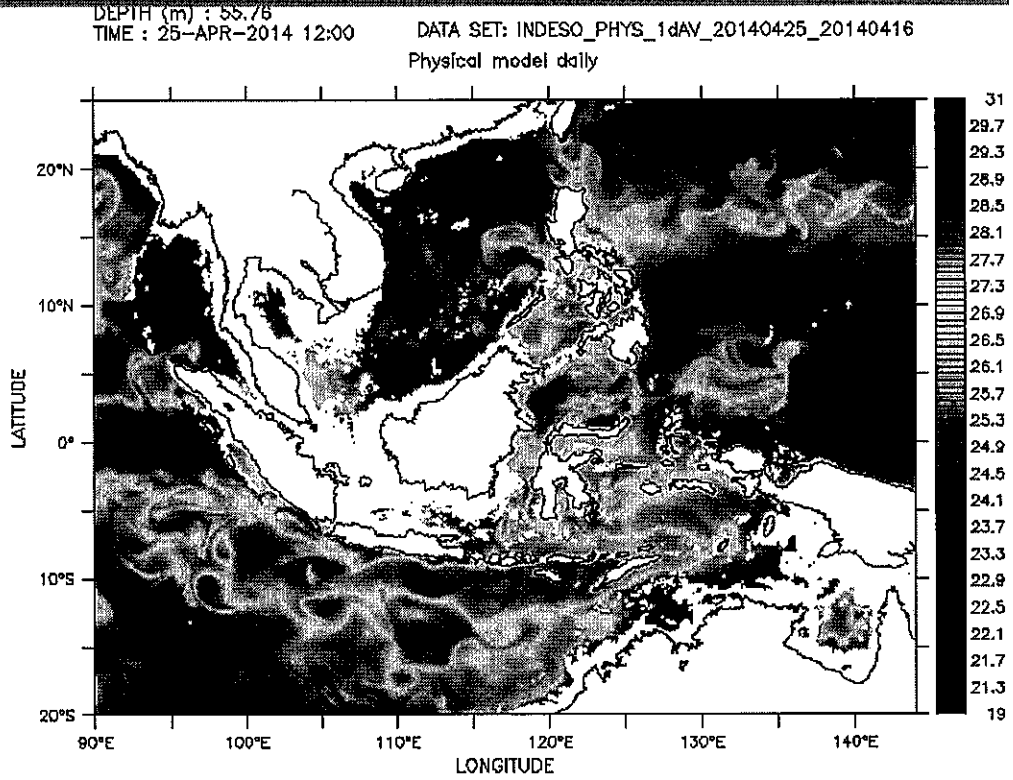
Temperature

At the surface



Temperature (degrees_Celsius)

At 50 m



Temperature (degrees_Celsius)

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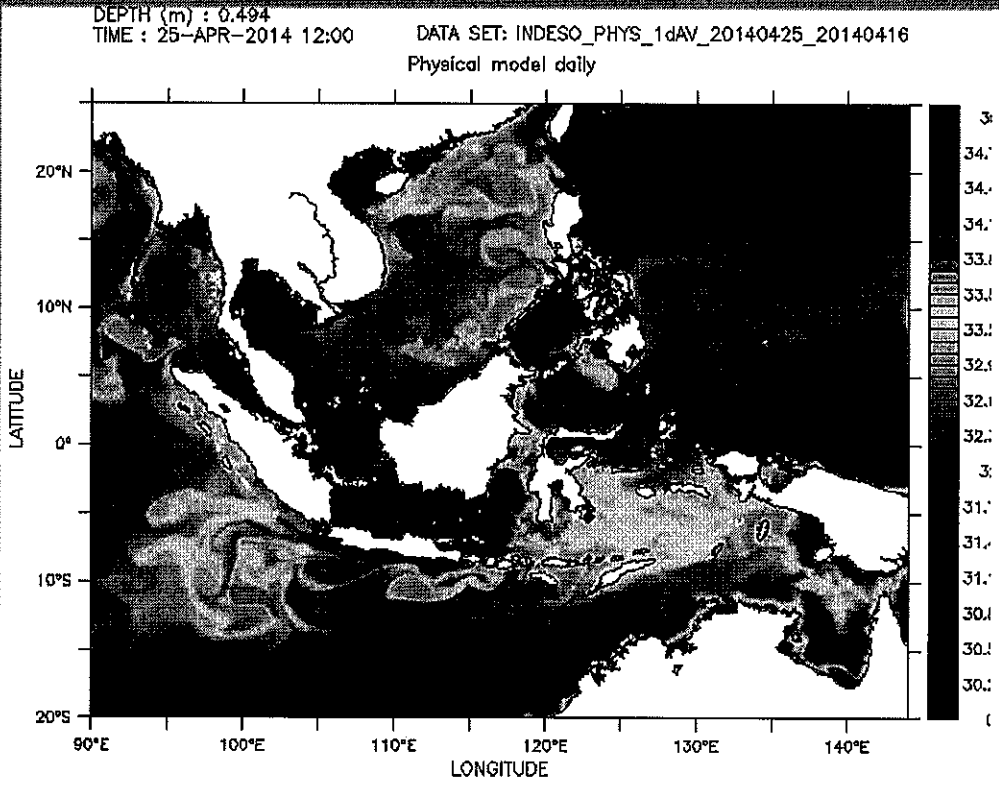
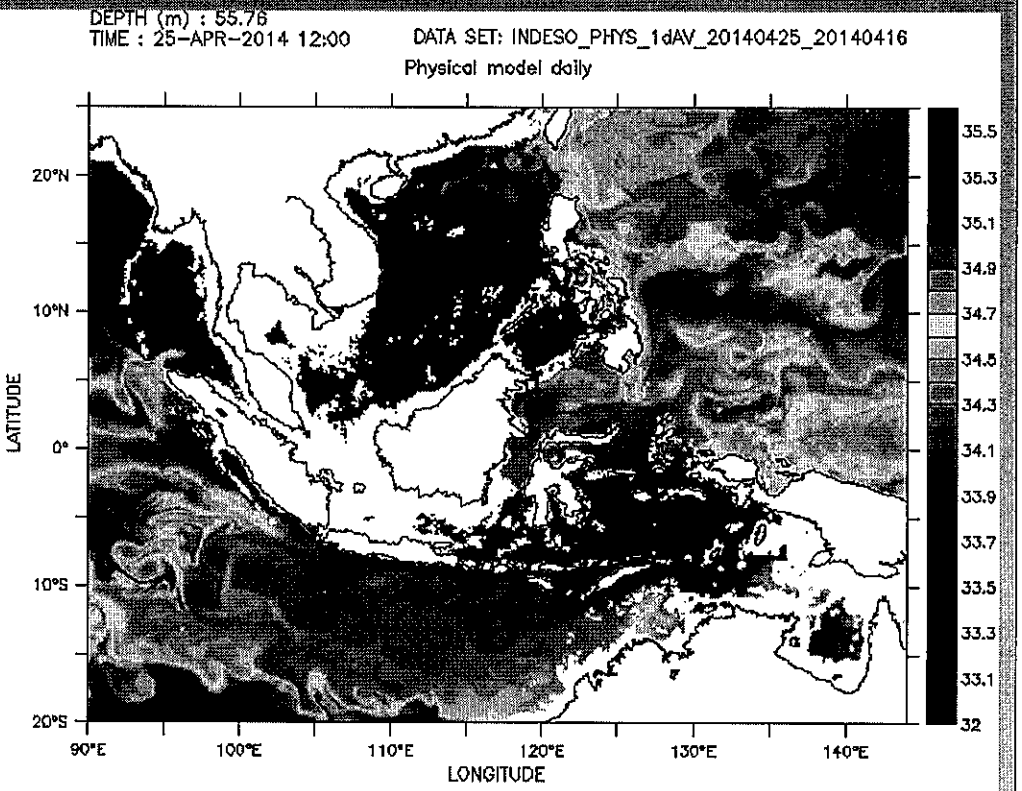
Salinity

At the surface



Salinity (PSU)

At 50 m



Salinity (PSU)

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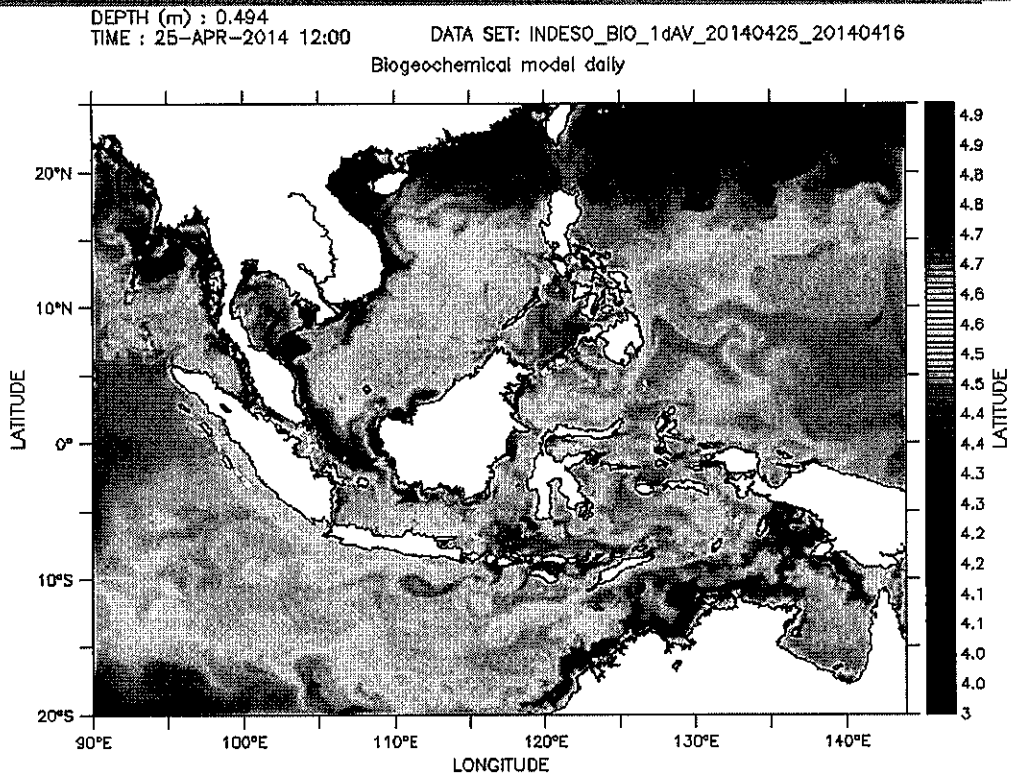
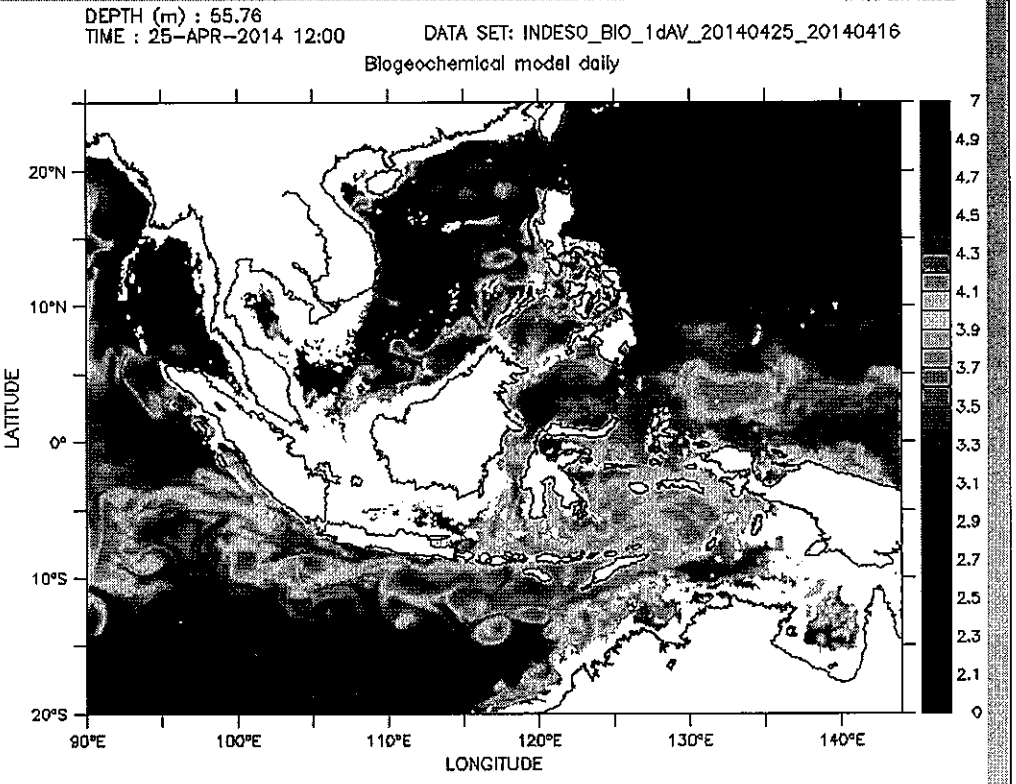
Dissolved Oxygen

At the surface



Dissolved Oxygen (ml 02 l-1)

At 50 m



Dissolved Oxygen (ml 02 l-1)

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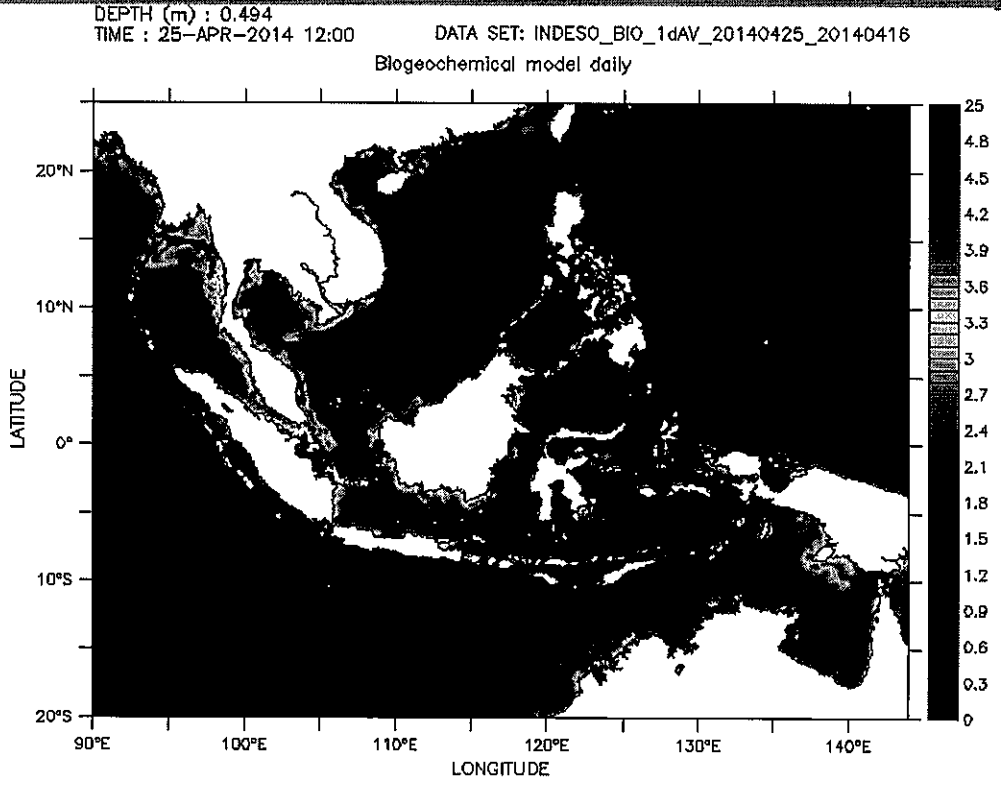
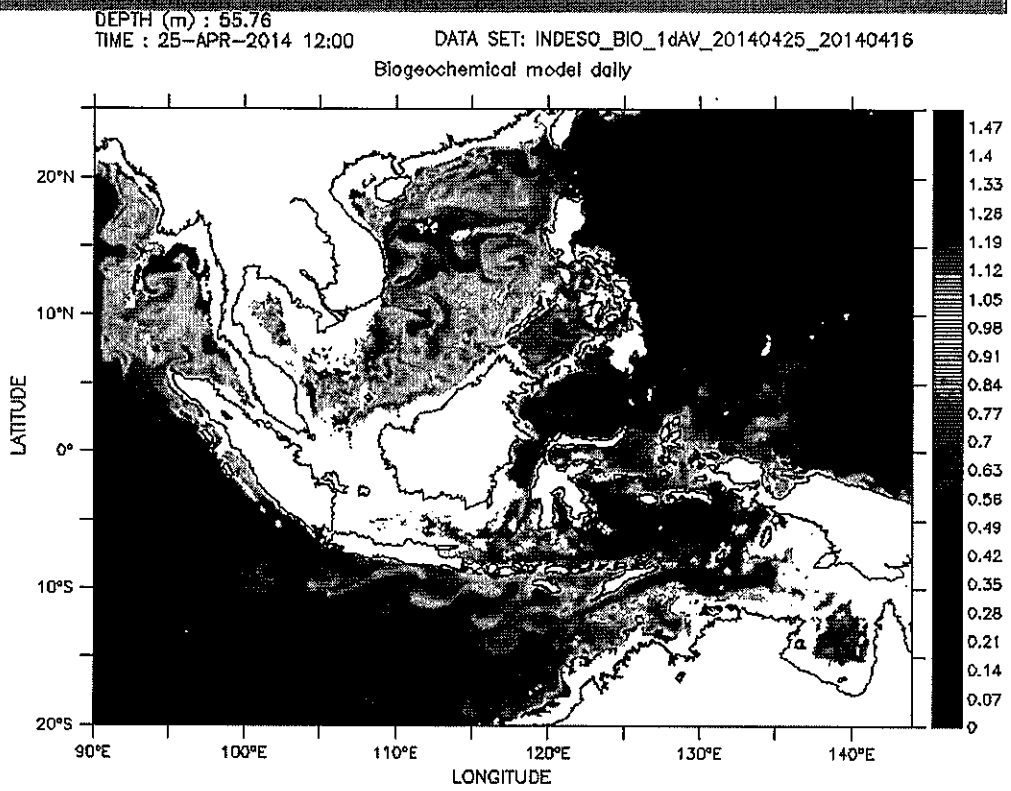
Mesozooplankton

At the surface



Mesozooplankton (mmol C m-3)

At 50 m



Mesozooplankton (mmol C m-3)

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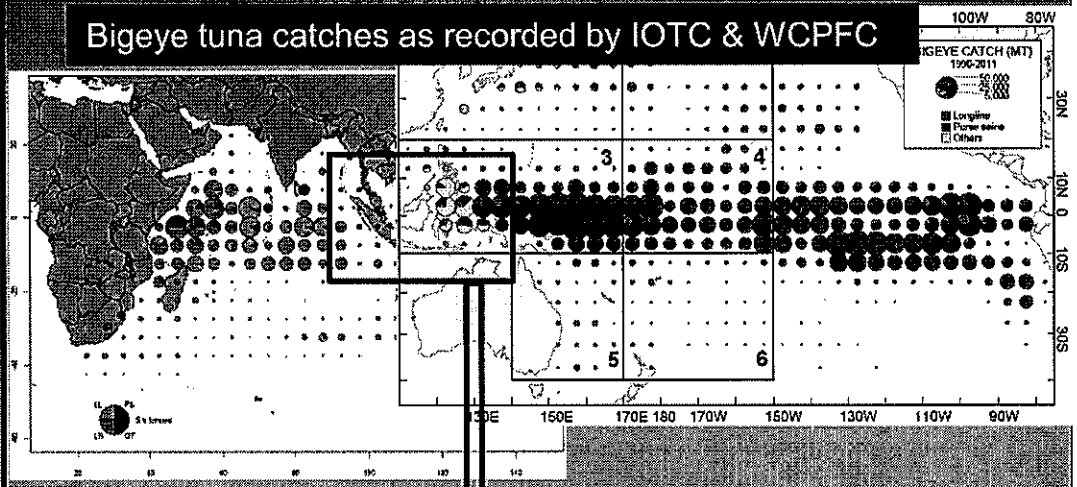
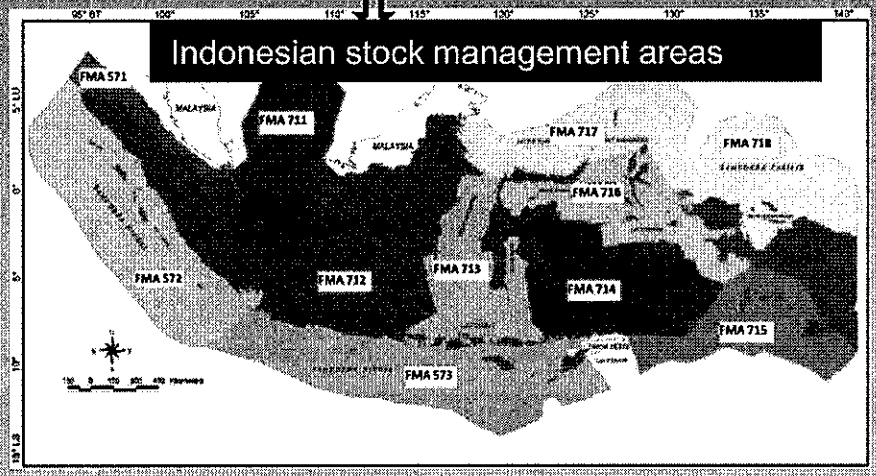
Tuna in Pacific and Indian Ocean

Challenges:

- The 3 main tropical tuna species (skipjack, yellowfin & bigeye) are exploited by multiple fishing gears/fleets
- These are highly migrant species managed by international commissions (IOTC, WCPFC, IATTC)
- Tuna stocks approach maximum level of exploitation (skipjack, yellowfin) or are overfished (bigeye)
- Fisheries data are often inaccurate and/or incomplete

Bigeye tuna catches as recorded by IOTC & WCPFC





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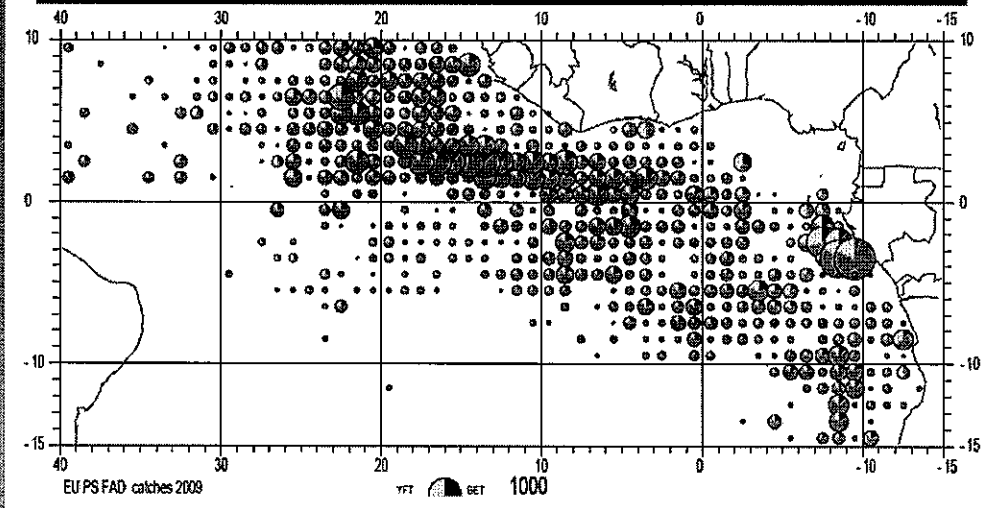
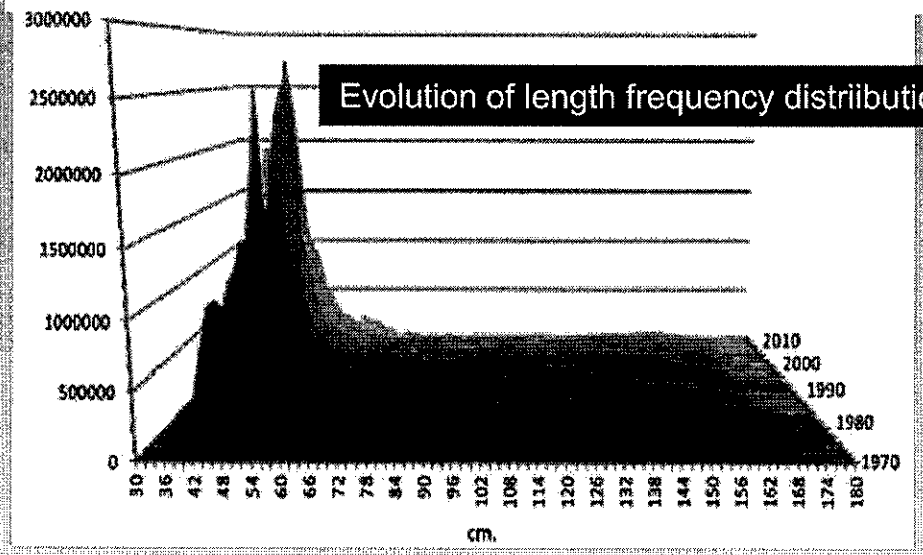
Standard tuna stock assessment

- At basin scale, tuna fishing activity is relatively well recorded (catch, effort, distribution of size)
- Information is used for estimating the stock average size over one-year
- Estimation is classically based on standard statistical methods that:
  - ✓largely ignore the impact of oceanic variability on the stock size are unable to estimate the stock distribution at small-scale

Observed catches for , and yellowfin





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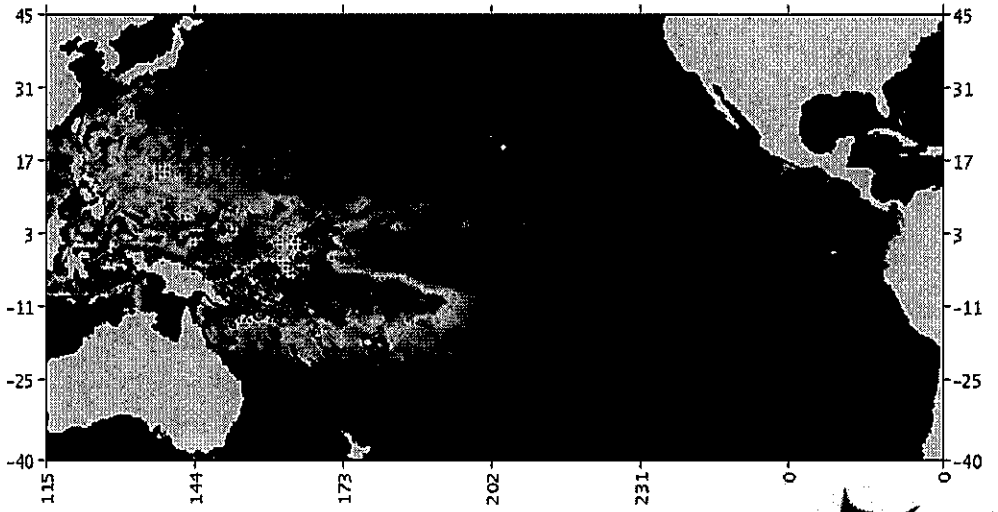
SEAPODYM: a new approach

SEAPODYM (Spatial Ecosystem And Populations Dynamics Model) is a radically different approach:

- It uses all information at its highest possible resolution in time and space
- It simulates all life cycle from larvae to oldest adults
- It separates environmental and fishing effects
- It provides real-time and stock estimation & forecasts that can be combined with VMS observation and satellite radar detection to monitor the fisheries operation

Predicted skipjack density (all cohorts agregated) and observed catch rates (black circles)



Resolution: 1/4° x week

In each cell of the model domain, at each time step, the model computes:

1) The production and biomass of 6 micronekton functional groups (tuna prey)
2) The density of fish for each age-cohort from larvae to oldest adult
3) The predicted catch by size as a function of the specified fishing effort in that cell

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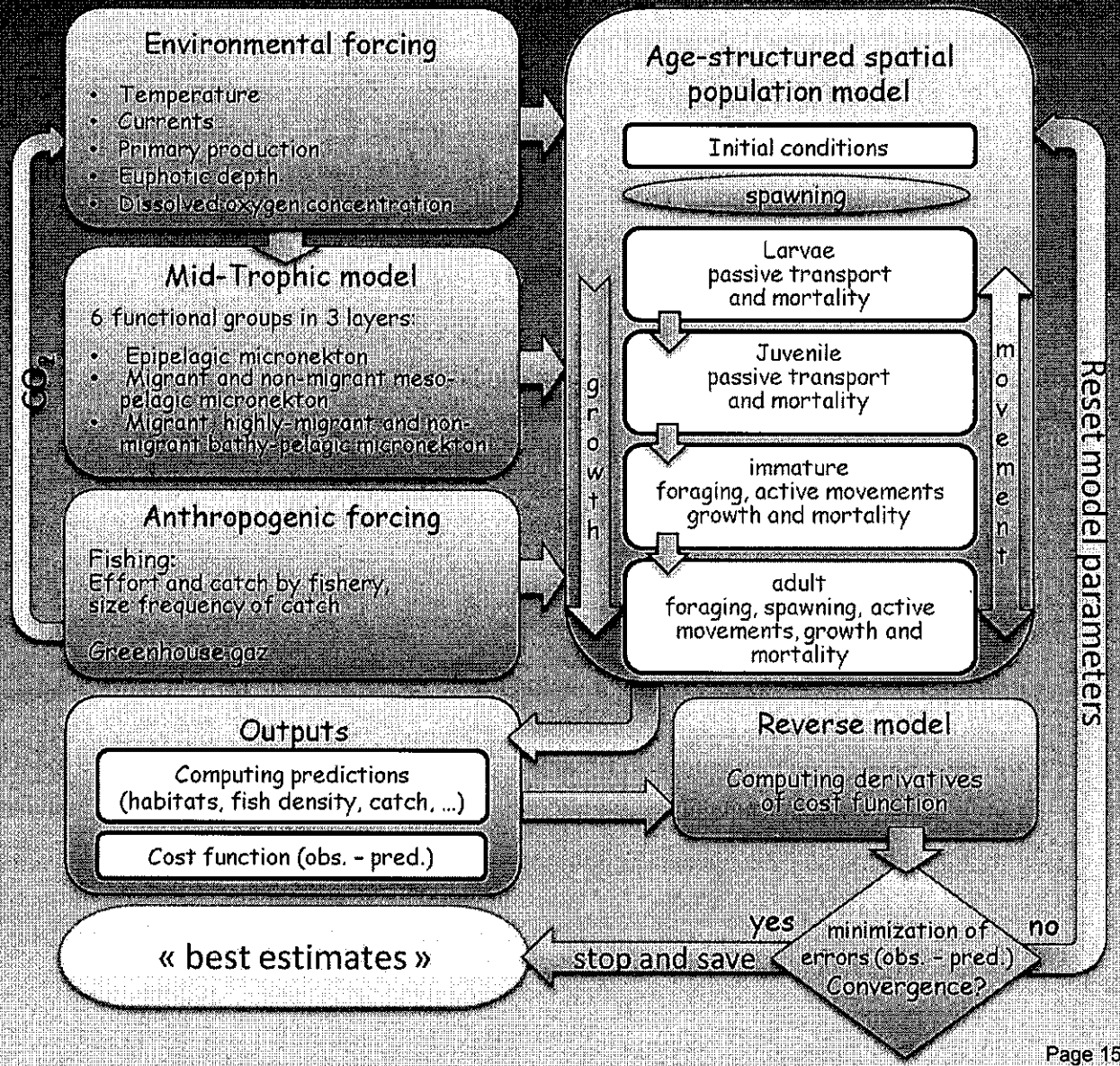
SEAPODYM structure

- ***SEAPODYM is forced by environmental variables (temperature, currents, primary production, euphotic depth and dissolved oxygen) to predict tuna prey distributions and spatial dynamics of tuna population***
- ***A robust statistical approach (Maximum likelihood Estimation) using spatialized fishing data provide optimal parameterization***



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SEAPODYM parameter optimization

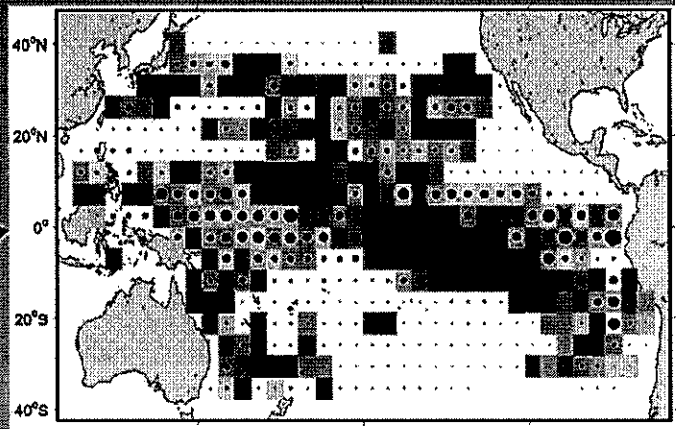
The optimization for each tuna species is done at coarse resolution typically (1°x month) at basin scale to include all the population and all available data over the historical fishing period

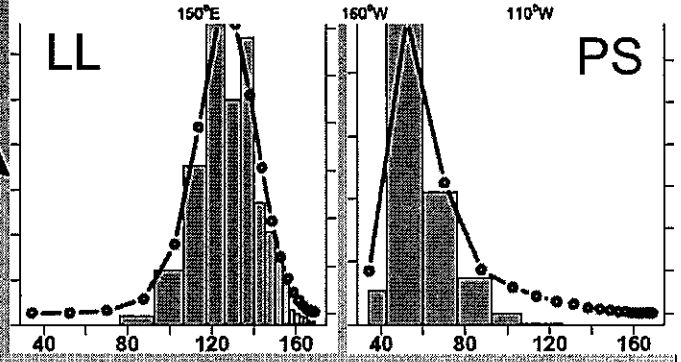
Spatial correlation

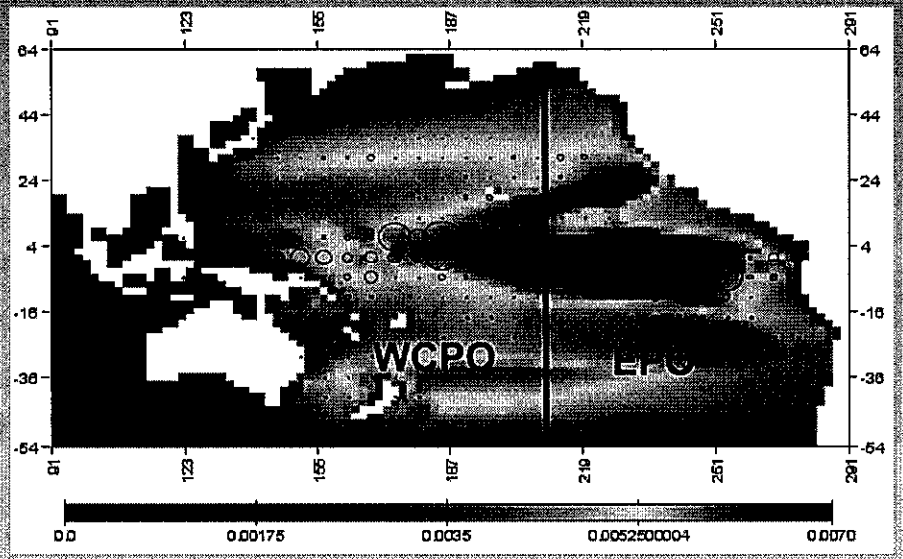
Fit to data

Size

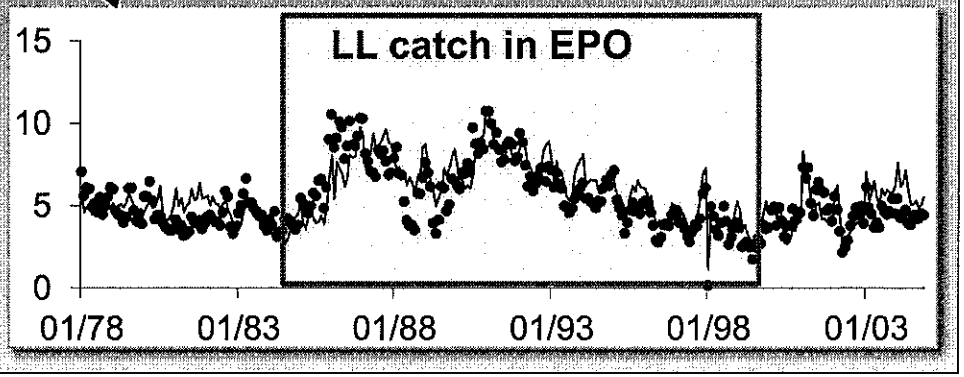
Catch /CPUE







Pacific Bigeye tuna predicted density distribution and observed catch (% circles)



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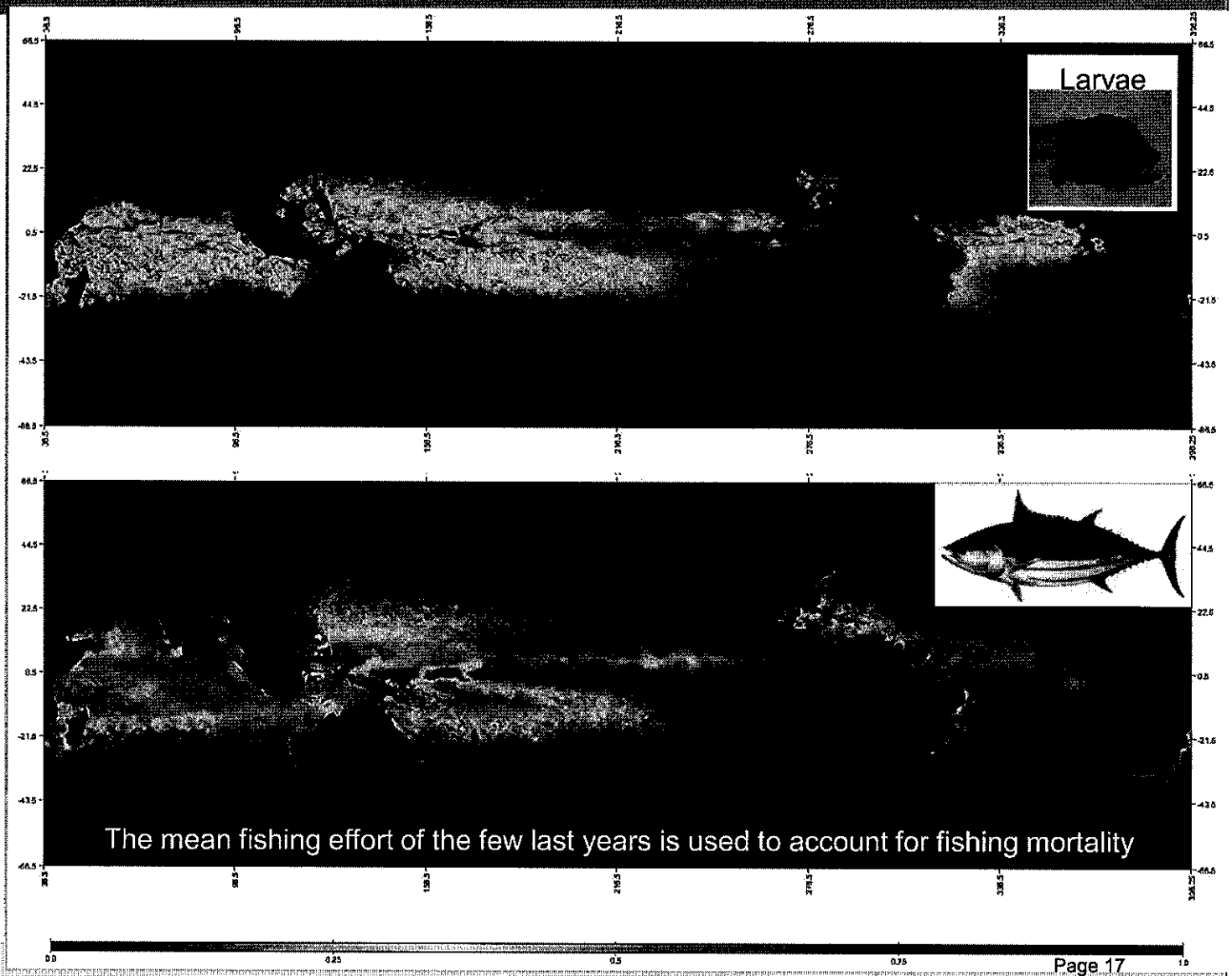
SEAPODYM – The global low resolution forcing model

A global operational version of SEAPODYM is implemented at basin scale at a resolution of ¼°x 1 week, to provide initial and boundary conditions to the regional model in Indonesian waters (INDO12)

Once a week it produces 4 weekly mean distributions
(1 week of hindcast, 1 of nowcast and 2 of forecast) for zooplankton, micronekton and 3 tuna species (skipjack, yellowfin and bigeye tuna)



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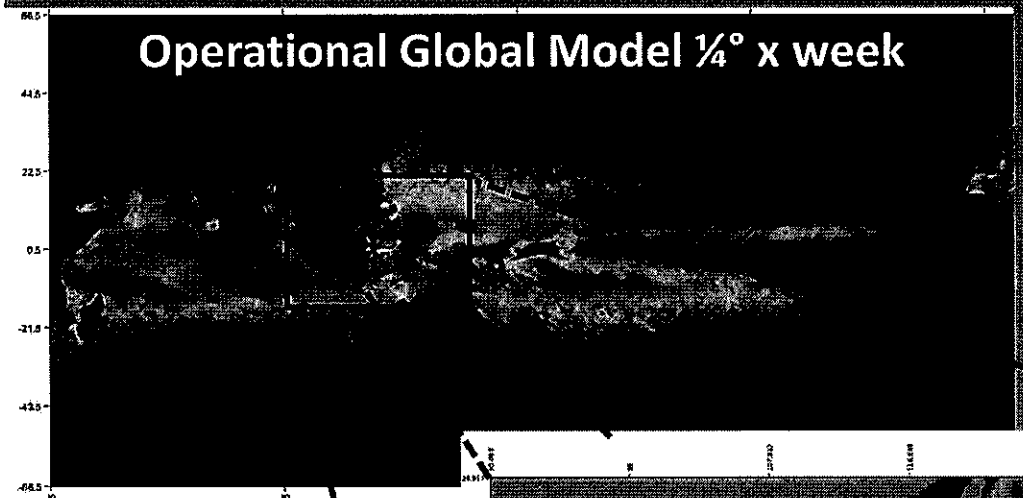
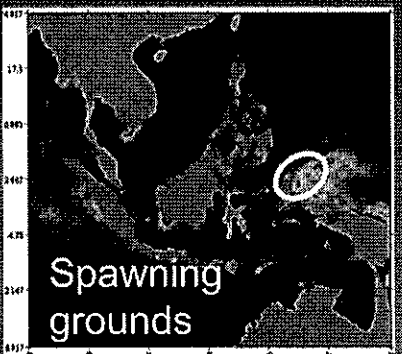
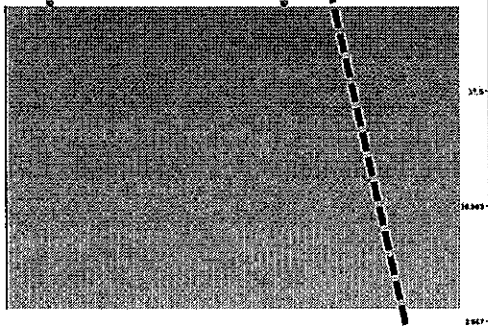
SEAPODYM the regional high-resolution model

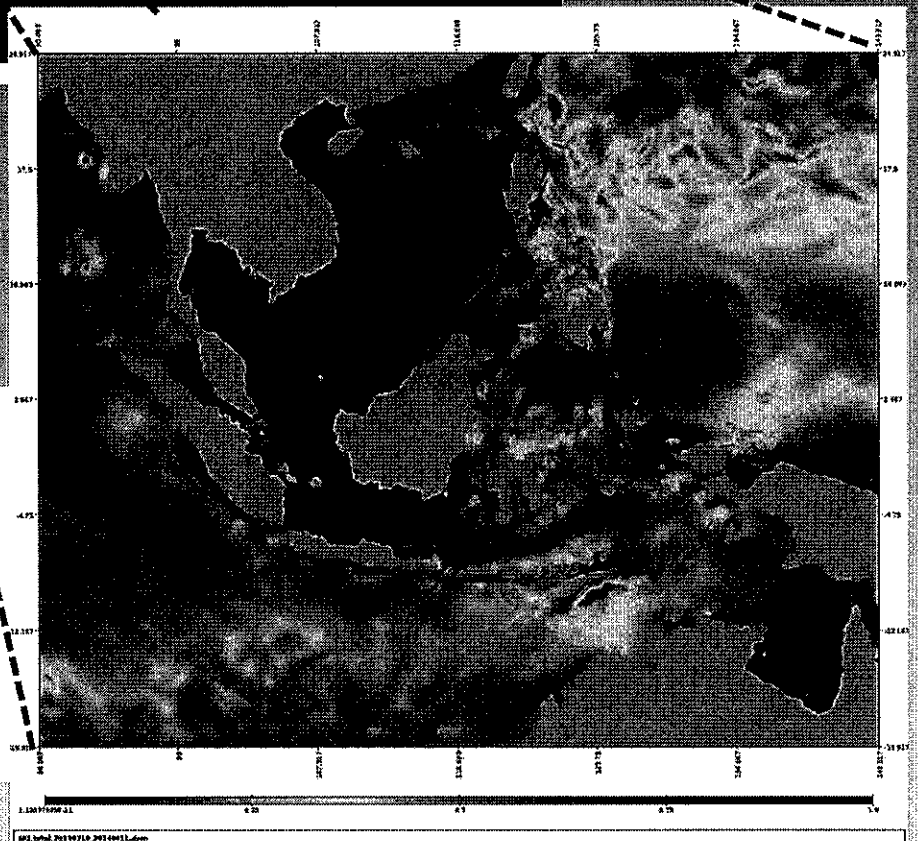


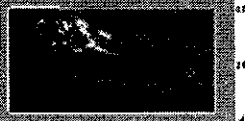
- Zooplankton
- Micronekton
- Skipjack
- Yellowfin
- Bigeye

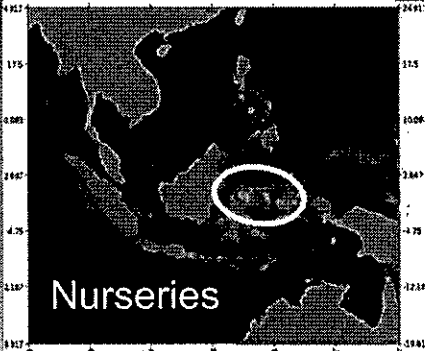

Larvae



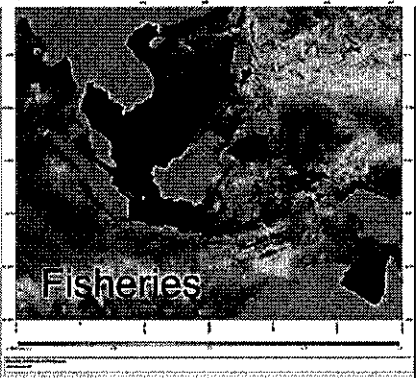





juveniles




Adults



Regional model
1/12° x 1day
with Open
Boundaries
Conditions provided
from global model

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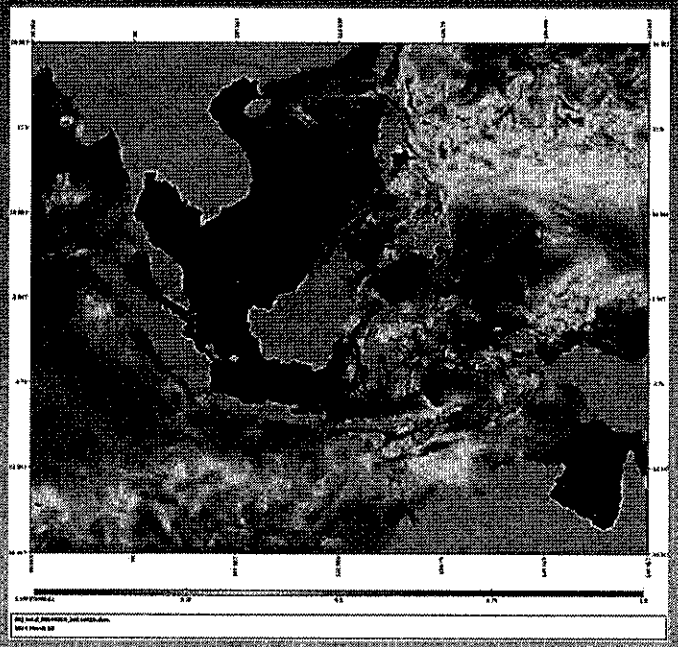
SEAPODYM OUTPUT for sustainable tuna fisheries



SEAPODYM outputs include, on a weekly basis : Abundance estimates (by FMA), Maximum Sustainable Yield (by FMA)

SEAPODYM detailed information on the stock distribution (by class of age) shall support:

- Optimal Catch and Effort Allocation
- Real Time monitoring of effort and catch
- Identification of spawning grounds & nursery areas and their time variability
- Illegal fishing control
- Rapid improvement of fishing statistics
- Rapid improvement of fish model

Thank you for your attention !

US Secretaray of State and Minister of Marine Affairs and Fisheries Indonesia visited Benoa Fishing Port in Bali during APEC Leader's Meeting 2013

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Asia-Pacific
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2014/SOM2/OFWG/032
Agenda: IV B 5

Report on the Self-Funded Project OFWG 01/2013S - Workshop on Fisheries and Their Contribution to Sustainable Development in APEC Economies: Small-Scale and Artisanal Fisheries to Support Food Security

Purpose: Information
Submitted by: Indonesia

APEC
CHINA 2014

3rd Ocean and Fisheries Working Group Meeting
Qingdao, China
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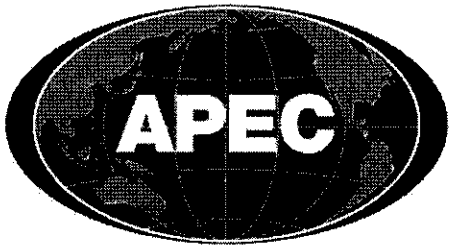

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Report of the Workshop on

Fisheries and Their Contribution to Sustainable Development in APEC Economies:

Small-Scale and Artisanal Fisheries to Support Food Security

Qindao, 11 May 2014

Background

In Asia Pacific region, small-scale fisheries contribute to livelihoods of ~357 millions people. These contributions to economic wellbeing and food security are under threat due to:

- Demand for seafood products is increasing
- Capacity to increase production from wild capture fisheries is limited
- Illegal, unreported and unregulated fishing (IUU Fishing)
- Fishing fleets are still expanding in some countries, which causes losses in profitability and further deterioration of fish stocks.
- Degradation of marine and coastal habitats, including fish spawning and nursery areas

Objectives

The objective of the workshop is to exchange best practices and experiences in order to increase the APEC economies awareness in small scale and artisanal fisheries.

The specific objectives are:

- share national and regional experience and upgrade practical skills and knowledge on small-scale fisheries activities;
- enhance the importance of small-scale fisheries to support food security from the ocean and fisheries resources;
- provide report to APEC *Ocean and Fisheries Working Group* to support APEC Work Plan on Mainstreaming Ocean-Related Initiatives;
- provide input for International Guidelines for Securing Sustainable Small-Scale Fisheries arranged by FAO.

Participants

11 APEC member economies have attended this workshop including Chile, Chinese Taipei, VietNam, Thailand, Japan, Malaysia, Peru, Philippines, Australia, PNG and Indonesia.

This workshop were also attended by international organizations such as FAO, WWF and TNC.

Participants came from international organizations, government agencies, non-governmental organizations, academic institutions and the private sectors.

Main Focus Discussion

The workshop focused on the following issues:

1. Consumer's ssues of small-scale fisheries production: continuity, distribution, access and quality
2. Good practices in the governance of small-scale fisheries, with a focus on rights-based approaches
3. Gender and small-scale fisheries in Asia and the Pacific: considerations, issues and good practices
4. Reducing vulnerability of fishing and fish farming communities to disasters and climate change impacts
5. Good practices in applying the ecosystem approach to small-scale fisheries

Outcome

Practical recommendations for supporting small-scale fisheries activities in APEC developing economies.

1. Recommendations on Consumer Issues of Small-Scale Fisheries Production: Continuity, Distribution, Access and Quality

- It is not necessary to define small-scale fisheries.
- Economies should strengthen data collection systems that are designed for small-scale fisheries.
- All representatives acknowledge that small-scale fisheries represent an important, and probably under-estimated part of the fishing sector in the Asia Pacific.
- Governments should address interactions between small-scale and large scale fisheries

1. Recommendations on Consumer Issues of Small-Scale Fisheries Production: Continuity, Distribution, Access and Quality (cont.)

- Government should focus on improving product safety, quality and reduction of post-harvest losses, safety on board, and traceability.
- Government should create opportunities for the private sector to reach out to small scale fisheries, thereby improving market access for small scale fisheries.
- As both small-scale and large-scale fisheries increasingly use Fish Aggregating Device (FADs), government should give attention to management of FADs in order to sustain fisheries.
- Management of small-scale fisheries should include capture fisheries, aquaculture, trade, processing, and marketing (supply chain approach).

2. Recommendations on Good Practices in the Governance of Small-Scale Fisheries, with a Focus on Rights-Based Approach

- Government should explore partnerships with private sector to improve management of near-shore fisheries.
- Government should invest in governance of small-scale fisheries, and look into ways to share management responsibility with rural communities and fishing companies.
- Government should protect small-scale fisheries from IUU fishing by domestic and foreign fishing vessels.
- Government should develop program to increase awareness of small-scale fishers on sustainability.
- Government explores granting exclusive fishing rights to groups of small-scale fishers.

3. Recommendations on Gender and Small-Scale Fisheries in Asia and the Pacific: Considerations, Issues and Good Practices

- Management and development strategies should specifically address the roles of males and females.
- A supply-chain approach must specifically address the role of women.
- Government should look for opportunities to include women in formal decision-making processes.
- Government should include women in fishery management processes.

4. Recommendation on Reducing Vulnerability of Fishing and Fish Farming Communities to Disasters and Climate Change Impacts

Government should increase economic resilience of small-scale fishers to face climate change.

5. Recommendations on Good Practices In Applying The Ecosystem Approach To Small-Scale Fisheries

- There is a need to articulate the roles of different government agencies in management of fisheries, especially in near-shore waters.
- Workshop participants acknowledge that small-scale and large-scale fisheries interact, and therefore governments should take a holistic perspective on fisheries management.

Next Step

Develop APEC guideline to prototype linkages small scale fisheries capacity into supply chain. This will need value chain analysis in each stages.

THANK YOU

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2014/SOM2/OFWG/035
Agenda: IV

Presentation on Policy Framework of Achieving Sustainable Marine and Fisheries Development Based on the Principles of the Concept of the Blue Economy

Purpose: Information
Submitted by: Indonesia

APEC
CHINA 2014

3rd Ocean and Fisheries Working Group Meeting
Qingdao, China
9-12 May 2014

NATIONAL OCEAN POLICY FRAMEWORK AND BLUE ECONOMY MODELS OF INVESTMENT

in ACHIEVING SUSTAINABLE MARINE AND FISHERIES DEVELOPMENT in Indonesia

Presented by Indonesia

APEC OCEAN AND FISHERIES WORKING GROUP

QINGDAO, 8-12 MAY 2014

POLITICAL WILL AND COMMITTMENT

- For Indonesia ocean is very important economically and ecologically since the fact that two thirds (2/3) of the territory is ocean with 17508 islands and coastal lines of 104.000 km.
- The fourth most populated country with more than 200 million people which mostly live in the coastal area, the area that is ecologically vulnerable.
- Ocean-based economy and ocean-related activities have been growing and tend to continue to develop in the next decades.
- Understanding the importance of the oceans and coasts, Indonesia has been committed to improving ocean and coastal management by establishing sustainable marine and fisheries development policy based on the principles of Blue Economy.

NEW INITIATIVES

- In order to achieve sustainable marine and fisheries development, Indonesia has initiated new approaches to managing the ocean and coasts through promoting good ocean governance and blue economy models of investment.
- Good ocean governance is required to provide appropriate policy frameworks in managing ocean-based economy and ocean-related activities with the principles of sustainability, accountability, integration, empowerment, growth with equity, and justice.
- Whilst Blue Economy Models of Investment is needed to promote environmentally friendly investment and businesses, supported by public investment on infrastructure and appropriate policies.

OBJECTIVES

1. **Promote Good Ocean Governance**, as the guiding principle of policies at all levels of authorities: national, provincial, and district governments
2. **Develop National Ocean Policy Frameworks**, as the guidelines of policy implementation in achieving sustainable marine and fisheries development
3. **Promote Blue Economy Models of Investment and Businesses**, as a means of achieving environmentally friendly business practices.

GOOD OCEAN GOVERNANCE: GUIDING PRINCIPLES

- **Principles:** sustainability, accountability, integration, decentralization, community empowerment, growth with equity, and justice.
- **Approaches:** integrated sea use management and ecosystem-based management for healthy and productive ocean
- **Legal aspects:** 1) Coastal and Small Island Management Act 27 of 2007 that was recently amended as Act 1 of 2014, and 2) Ocean Act that has been ready for approval by the Parliament and expected to be effective by next year.

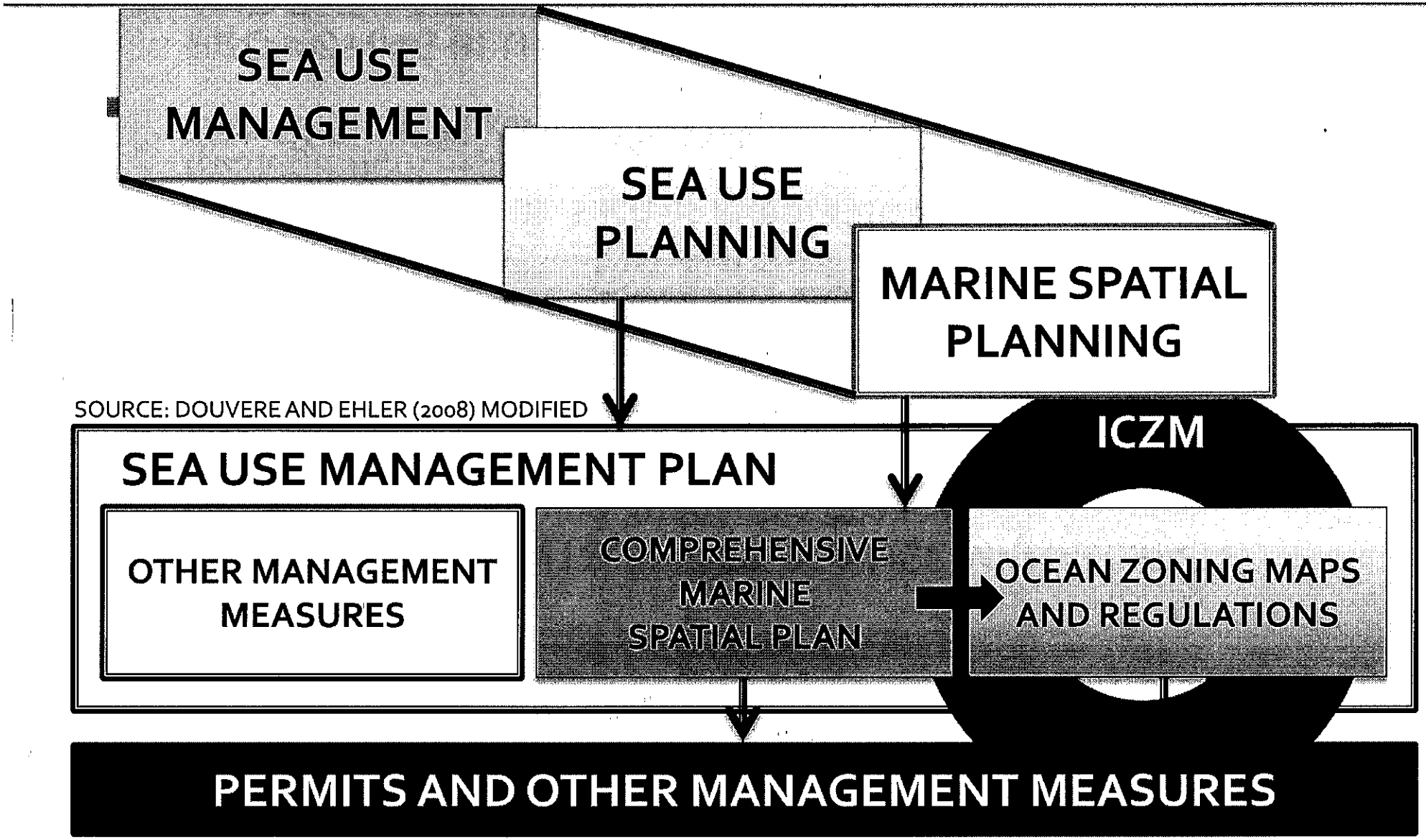
OCEAN POLICY FRAMEWORK

1. **IMPLEMENTING INTEGRATED SEA USE MANAGEMENT:** spatial marine planning, managing ocean space, natural resources and ocean-related services that include fisheries, sea transportation, mineral and energy, marine-based industry, and tourism

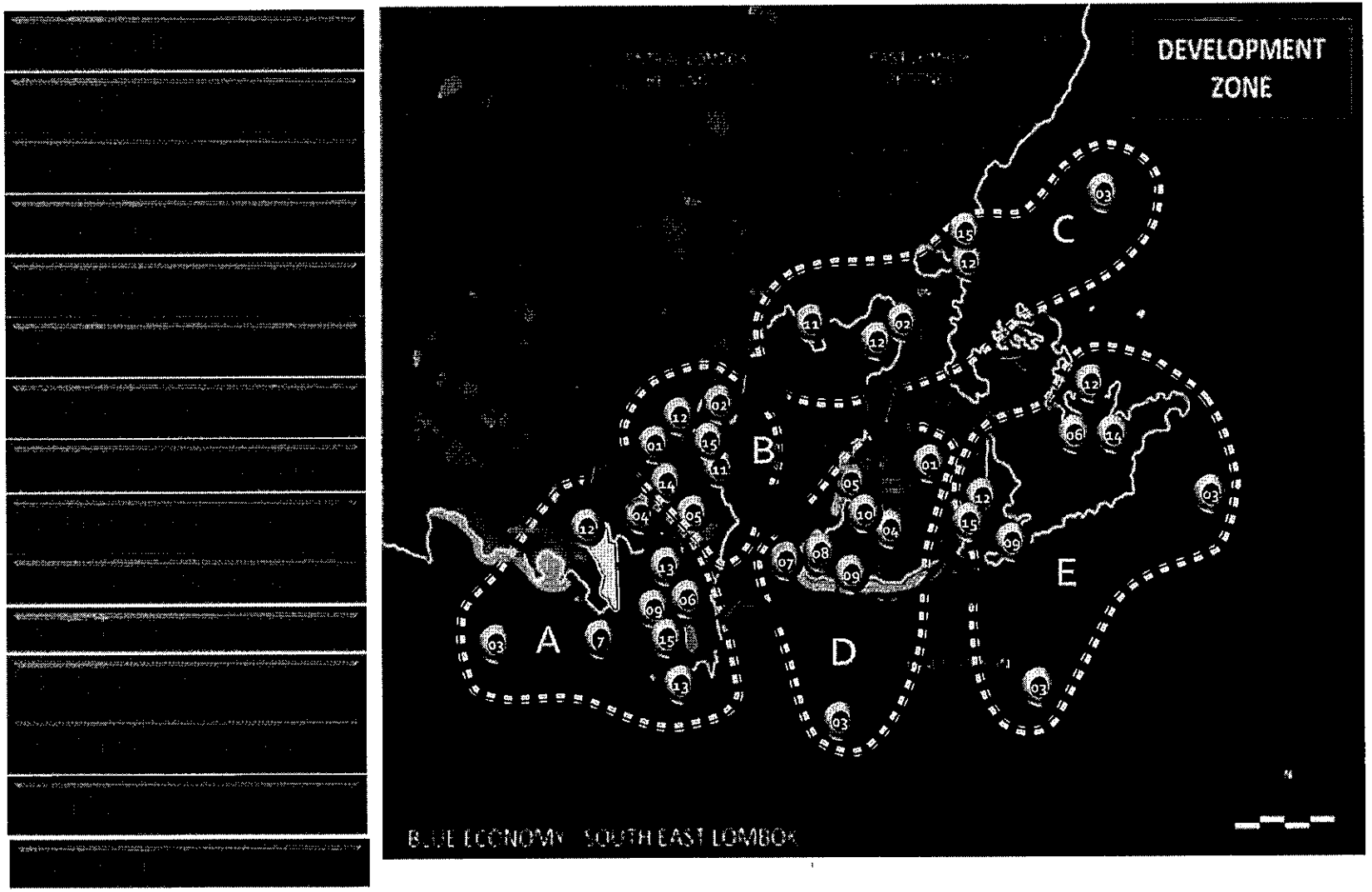
2. **DEVELOPING BLUE ECONOMY ZONE:** integrated land-based and ocean-based development through applying ecosystem-based management, such as integrated coastal zone management —pilot projects: Lombok Island in collaboration with FAO and Nusa Penida, Bali

1. **PROMOTING BLUE ECONOMY MODELS OF INVESTMENT AND BUSINESSES:** environmentally friendly investment based on the principles of nature's efficient, leave nothing to waste, and social inclusiveness

INTEGRATED SEA USE MANAGEMENT
ACT 27/2007 jo ACT 1/2014 and OCEAN ACT



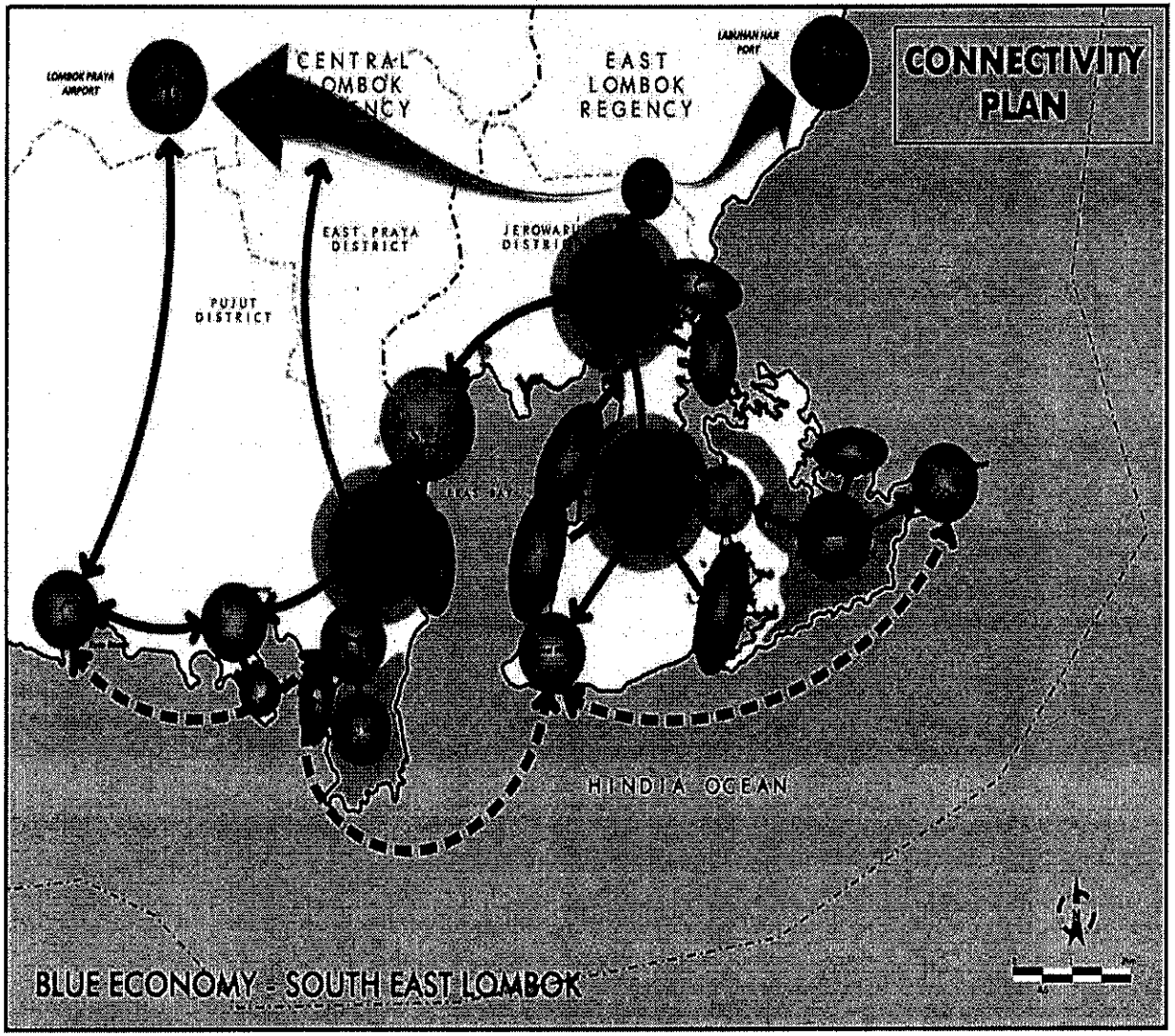
BLUE ECONOMY ZONE DEVELOPMENT
CENTRAL AND EAST LOMBOK ISLAND



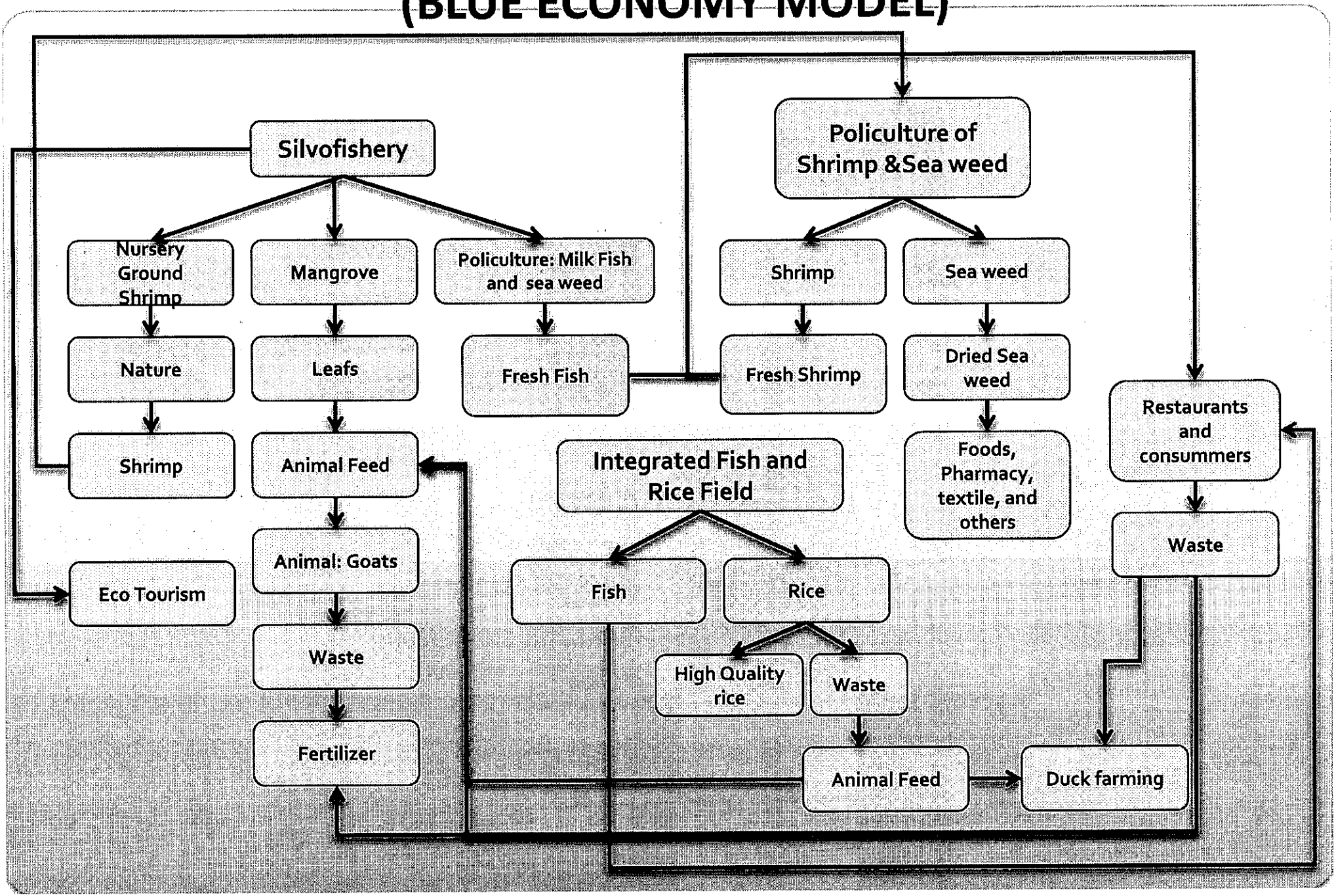
CENTRAL AND EAST LOMBOK ISLAND CONNECTIVITY PLAN

LEGEND :

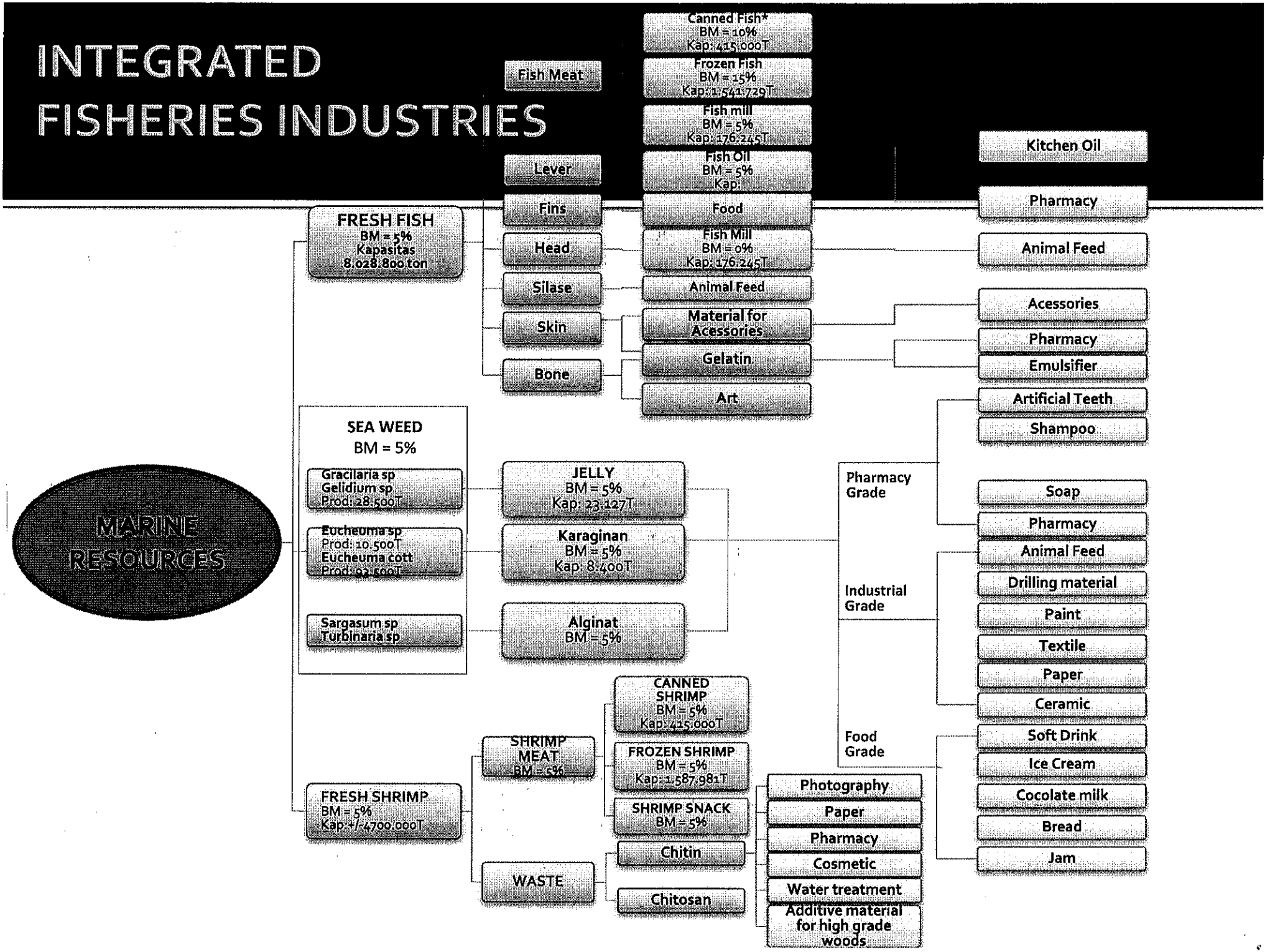
- development center
- secondary land connection road
- Tourism activity connection by sea
- regency border
- district border
- transportation node
- tourism potential node
- administrative node /population center
- salt potential node
- ecological node
- sea use potential node



INTERGRATED AQUACULTURE (BLUE ECONOMY MODEL)



INTEGRATED FISHERIES INDUSTRIES



THANK YOU

BLUE ECONOMY = BLUE OCEAN, BLUE SKY, AND BLUE GROWTH