



BMKG

PROCEEDING



International Workshop

Climate and Weather Information Services in Supporting Adaptation and Mitigation to Climate Change in Transportation and Tourism

Ritz Carlton Hotel, Jakarta - Indonesia, 15 -16 May 2012

**CENTER FOR CLIMATE CHANGE AND AIR QUALITY
THE INDONESIAN AGENCY FOR METEOROLOGY CLIMATOLOGY AND GEOPHYSICS**



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P A P E R S
TRANSPORTATION

Marine & climate research contributions to the national program on climate change adaptation & mitigation

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Abstract

As an implementation for supporting the national action plan for Green House Gases Reduction (as mentioned on PERPRES No.61/2011), the Agency for Marine and Fisheries Research and Development, Ministry of Marine Affairs and Fisheries Republic of Indonesia has 4 research programs related on these topics. One of those programs is related with ocean-climate research activities which have been covered by the Indonesia - China Center for Ocean and Climate. This presentation will give a portrait for some research activities and their results regarding to the understanding of the Indonesian Monsoon based on currently measurement results and will describe these research activities roadmap up to 2014. Part of those research results are being considered as projections to participate on the national development planning for climate change adaptation. A collaborative concept with BMKG as a contribution to the climate change adaptation and mitigation for transportation sector also will be presented.

Keyword(s): marine and climate research, climate change, adaptation, mitigation, transportation

Introduction

As an implementation for supporting the national action plan for Green House Gases Reduction (RAN-GRK as mentioned on PERPRES No.61/2011, see 2nd Annex, page of 18), the Agency for Marine and Fisheries Research and Development, Ministry of Marine Affairs and Fisheries Republic of Indonesia has 4 research programs related on these topics. Those are: 1. Research for Marine Carbon in Indonesian seas (location: Indonesia coastal waters and Coral Triangle Initiatives region seas); 2. Study for marine hazard response to climate change in the southeast regions (locations: South China sea and Karimata strait); 3. Indonesia Global Ocean Observing System (INAGOOS) Implementation which were located in Jakarta, Bali and Indonesian seas; 4. Indo-China Ocean and Climate Research Center (ICCO) Research Activities which were located in Sunda strait, Indian ocean, and Karimata strait.

All those activities above have been running before the RAN-GRK was formed, such as The Research on Marine Carbon in Indonesian Seas has been started since 2008 by taking

Banten Bay as a pilot project area, then the expanded pilot study has been developed since 2011, and a plan was made for Blue Carbon Center at AMFRD on 2014/2015.

A study for Marine Hazard Response to Climate Change in southeast region has been implemented since 2010 and still continuing up to now for monitoring and measuring ocean-climate parameters by using research vessels.

A concept of Indonesia Global Ocean Observing System (INAGOOS) has been officiated by former minister of Marine Affairs and Fisheries, Mr. Freddy Numberi, in 2005 and it was relaunched at the IOC-WESTPAC meeting in Denpasar Bali in 2010. At the end of 2011, a strategic plan of INAGOOS has been initiated. The agenda for this year (2012) will be focused on finishing for strategical plan involving many institutions (including BMKG) under supervised by IOC-Indonesia.

A research cooperation of Indonesia-China or Ocean-Climate has been initiated on 2007 by monitoring Java upwelling variations, and investigating for the water mass transports exchanges of South China sea and Indonesian seas. In the next topic the ICCOC results will be presented.

Implementation results of ICCOC

In addition to research cooperation between AMFRAD and FIO-SOA (First Institute of Oceanography - State Oceanography Administration) China since 2007, also has been established the Station Monitoring for Indian Ocean at Bungus Bay, West Sumatra, which were authorized by Research Division for Coastal Resources and Vulnerability, AMFRAD, 2010. An Ocean-Climate Interaction Researchs have been developed to the impact for coastal and marine resources such as a research program for The Monsoon Onset Monitoring for Social and Ecosystem Impact (MOMSEI). The capacity building also has been implemented through PhD scholarship and training programs. In projections for 2012a PhD in hydrodynamics numerical modeling will be graduated and 1 Ph.D candidate in 2013 will be promoted.

Another positive parameter from fruitfulness for research cooperation with SOA, a wider research cooperation has been formed by SIO (Second Institute of Oceaography) and TIO (Third Institute of Oceanography)focussing on marine resources , one of activities is Marine Station in Natuna Island and ICCOC building.

Concepts on supporting to the transportation sector

The data and information resulted from ICCOC generally are useful for detail investigating of Indonesian Monsoon. In situ measurement in ocean through research activities on board by using Research Vessel and the Atmospheric-Subsurface Mooring Buoy systems when those data collaborate with sattelite and BMKG station data could be used as an initial condition for model simulation for giving information in extreme weather forecast and sea lanes transportation factor at Climate Change Research Center BMKG.

A fact that the Karimata Strait, Makassar Strait, Halmahera Sea and Lifamatola Channel in the time period before Indonesia Independence, these straits were useful for trade and

transportation lines. Based on 106 shipwreck identifications at the era ~1600 up to ~1900, a lot of ships occurred accidents caused by nature conditions, such as the extreme weathers triggered the ships getting lose direction, crossed the corals and hills and broke due to the storm and typhoon (Hasanah, 2012a & 2012b).

Eventhough the high-technology for shipping currently supported by highly safety systems, the informations about the atmospheric and sea conditions such as waves, winds, current always be needed, specially for ships under 30 GT that usually these ships or boats are used for people daily transportation in the islands and fishery catchment. Mostly in the straits location the effect of sea dynamic such as Internal Wave affects to the ship navigation. This sea-subsurface phenomenon generates the wave amplitude propagates during tide frequency and changes the water level pressure at the sea surface due to Internal Wave motions and reflections in the sea-subsurface. The Internal Wave indications has been founded in the Lombok Strait and Lifamatoa Channel. (S.Makarim, 2010, 2012 a, 2012 b).

The extreme weather forecast also important for land transportation sector. Based on BNPB data collected 2001-2009, mostly collapse road caused by flood is 99%, while collapse bridges data caused by flood (66%), landslide (4%) and its coupled (30%) (BNPB, 2012). And the dominantly event appeared is during northwest monsoon.

Strategic Recommendation

A trilateral cooperation between KKP, BMKG, an Transportation Ministry are needed related to research activities and sharing data and information for Climate Change Mitigation and Adaptation. An idea for installing an accurate sensor of carbon dioxide and sea-air parameter on the ships /boats in continus systems will be useful for measuring the carbon flux potency in Indonesian Seas. The implementation for installing 1 unit CO₂ sensor is very expensive but this step could be considered as an invest for delivering data in carbon trade. As an example, a shipping cargo cooperated with Southampton University measured carbon acusion during its cruise. (Hydes, et al., 2012).

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