SURFACE WATER FLOW PATTERN TAMBELAN ISLANDS RIAU

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Abstract

Research ocean current patterns beginning Tambelan performed using the esearch vessel Baruna Jaya VIII of the date of November 4 to 16, . In determining the flow pattern using 75 Khz ADCP measure and to determine the characteristics of the water masses using CTD 911 Plus. The number of points Tambelan research station in waters up to 12 stations. For the data used is the tidal ebb and flow of data from the station Pemangkat Hydro Oceanography Department, Navy. Currents in the water system is mainly influenced by the regional water mass movement, the changing seasons, tides, marine topography and geography, while the water mass characteristics are influenced by water masses characterized by shallow water at high temperature and low salinity. Regionally, the mass of water in the western waters. Float trajectories shown in Figure indicated that the mass of water from the ocean Fasifik into the South China Sea through the Luzon Strait and establish branches toward the Strait Karimata. Even the number of passes through the Strait Karimata float higher than the main route through the Strait of Makassar ITF.

Key Words: *Tambelan island, oceanography*

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1. INTORDUCTION

Administratively Tambelan Islands are in the Riau Islands. The islands are geographically located in the Natuna Sea waters. Tambelan waters located between two large waters, South China Sea and the northern side of the strait Karimata and marine waters in the southern Java.

Research activities in the archipelagic waters Tambelan performed using 75 Khz ADCP measurement tools to determine current patterns and CTD 911 Plus to determine the characteristics of the water masses. The number of points Tambelan research station in waters up to 12 stations along the track ADCP data plus Research Vessel Baruna Jaya VII. For the data used is the tidal ebb and flow of data from the station Pemangkat Hydro Oceanography Department, Navy.

Currents in the water system is mainly influenced by the regional water mass movement, the changing seasons, tides, marine topography and geographical location. while the water mass characteristics are influenced by the mass of water in the shallow waters are characterized by high temperature and low salinity. Regionally, the mass of water in the western waters Tambelan influenced by water masses from the south china sea.

Based on data buoy drift trajectories as an indicator of ocean surface currents from the Global Drifter from August 1988 to June 2007 have shown that Karimata Strait is an important part of the water masses that pass through the South China Sea to the waters of Indonesia

through the western waters Tambelan, Figure 1. In fact, the number of drifters that pass through the Strait Karimata higher than the main ITF through Makassar Strait, and no Drifters through Mindoro Strait. This phenomenon will play an important role in the seasonal time scale inter-annual to reshape the structure of the main vertical ITF (Gordon et al, 2003; Qu et al, 2006 and Tozuka et al, 2007).

Float trajectories shown in Figure indicated that the mass of water from the ocean Fasifik into the South China Sea through the Luzon Strait and establish branches toward the Strait Karimata. Even the number of passes through the Strait Karimata float higher than the main path through the ITF (Indonesian Through Flows) Makassar Strait.

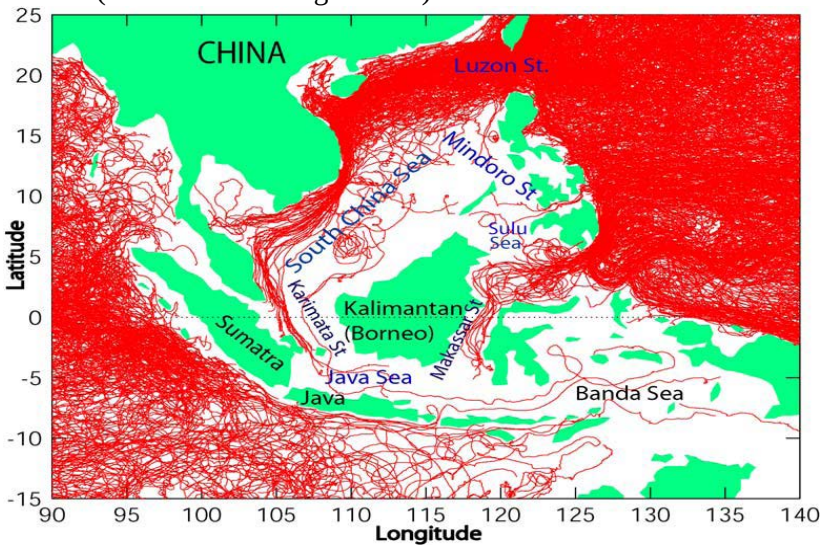

Figure 1. Race-track satellite drift buoys from the Global Drifter Program (8/1988-6/2007). The data set is owned by NOAA / AOML.

While the mass of water in the waters of the eastern Tambelan influenced by the mass of water from the coast of Borneo. surface water mass circulation, in coastal waters Kalimantan is largely influenced by the monsoon system. Surface currents along the coast of Borneo flows north west either during the season (Northeast monsoon, December Feb) as well as during the East (Southwest monsoon, June August), Figure 2.

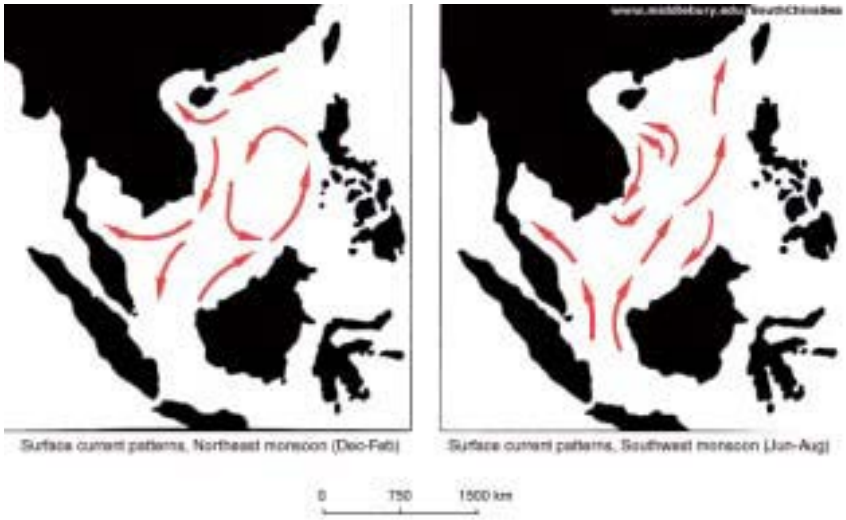

Figure 2. The pattern of surface currents during the west (Northeast monsoon) A) and the East (Southwest monsoon B).

2. GOALS AND OBJECTIVES

The objectives of this research are: Reliable data oceanographic conditions that can be utilized in the management and maintenance of a sustainable marine environment. The objective of this study is: Doing capture field data to obtain information about the characteristics and circulation of the water masses in the waters Tambelan Islands.

3. MATERIALS AND METHODS

Sources of key data used in this report is the data speed and direction of currents, water depth and backscatter obtained from 75 Khz ADCP measure the mass of water and the character of equipment CTD SBE 911 Plus is equipped with a rosette sampler. Taking the data for the waters Tambelan held on Date 4 to 11 November 2010.

Measurements of ocean currents carried by Acoustic Doppler Current Profiler (ADCP) 75 Khz mounted Research Vessel Baruna Jaya VIII. Current vertical profile measurements made at intervals of 5 m to a depth of each measurement interval of 2 seconds from 14:06 m to a depth near the base. Measurements were taken at each station the points that have been determined as well along the path the ship moving at speeds between 7-8 knots. Parameter measurements collected includes speed and direction of currents, water depth, and backscatter.

Measurement of water mass characteristics in the waters Tambelan conducted with 911 Plus CTD mounted Research Vessel Baruna Jaya VIII. Vertical profile measurements of water mass character made from the surface to near the base station at any point in a predetermined point. Parameters collected include, profiles of temperature, salinity, brightness, dissolved oxygen and chlorophyll.

Additional equipment on the 911 plus CTD used to measure chlorophyll is Mk III Aquatracka (Biospherical Instruments Inc.) Calibrated 2009, measuring pH is SBE 18 pH sensor (Sea-Bird Electronics, Inc..) Calibrated 2009, measuring the brightness is CStar Transmissometer (Wet Lab, Inc.) calibrated 2009, measuring dissolved oxygen is SBE 13 DO sensor (Sea-Bird Electronics, Inc..), calibrated 2009, and turbidity measurement is Optical Backscatter Sensor, OBS-3 (D & A Instruments) calibrated 2009.

The positioning is done using GPS Positioning done that has been installed on the ship Baruna Jaya VIII. and bottom tracking of the measuring instrument ADCP. CTD and ADCP

Data Data recorded in the waters Tambelan Islands by 12 stations, while the ADCP track data were collected around the islands as much as 4 tracks Tambelan and 1 track in the waters between islands in the Northeast and Southwest side. Tidal data is used as reference data is tidal Pemangkat (01 ° 2'U - 109 ° 0 T) issued by the Office of Naval Oceanographic Hydro.

Field data have been obtained during the field work processed during and after the field work done. Preliminary data processing performed during field activities to get the results and the quality of the resulting data. Further data processing is performed after the field activities include: the conversion of raw data to gauge the amount of technical, data quality control, data archiving, data visualization and analysis.

Location, trajectory and position measurement stations in the waters of the water mass character Tambelan presented in Figure 3 and the data retrieval time by tidal pattern is presented in Figure 4

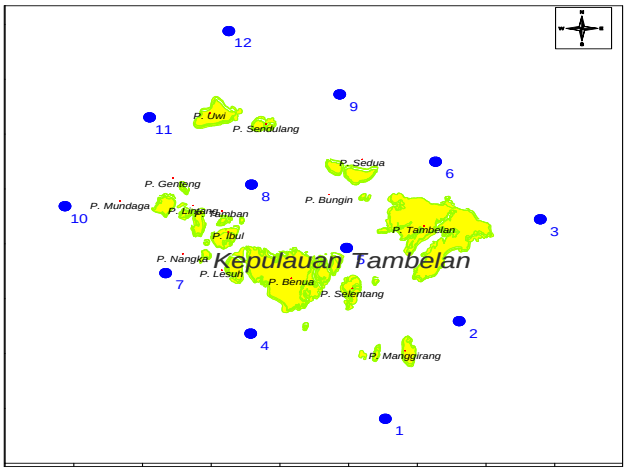

Figure 3. Location data acquisition on research undertaken Date 4 to 16 November 2010 at the Waters Tambelan, Riau Islands.

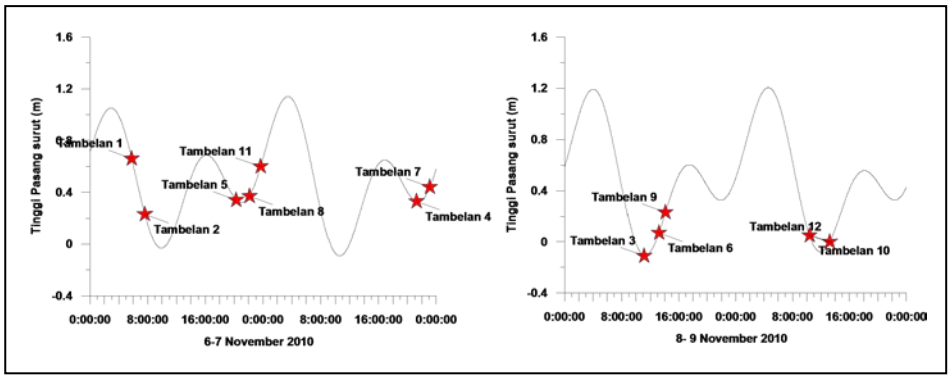

Figure 4. Data retrieval based on pattern Tambelan tidal waters, Nov 2010.

4. RESULTS AND DISCUSSION

In general, the surface current regional monsoonal currents and tidal currents in the waters Tambelan influence can be seen in the schematic of Figure 5

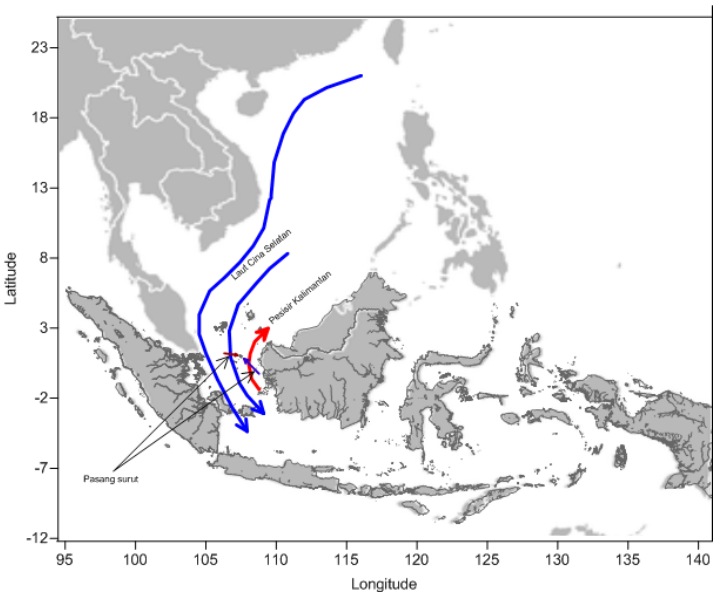

Figure 5. Schematic mass movement of surface water in the western waters Borneo.

The movement of water masses during the study, although in the daily scale, indicating that at high tide the water masses coming from the south china sea will fill Tambelan waters and vice versa at low tide the water masses originating from the coastal waters of Borneo will fill it.

In these conditions into pairs, the mass of water moving towards the northeast (station Tambelan 6, 9, 11, 12) except in the western islands Tambelan (Tambelan station 4, and 7) the mass of water moves to the southeast and in the strait between the islands southwestern part and northeast (station Tambelan 5 and 8) masses of water moving from north to south, Figure 6.

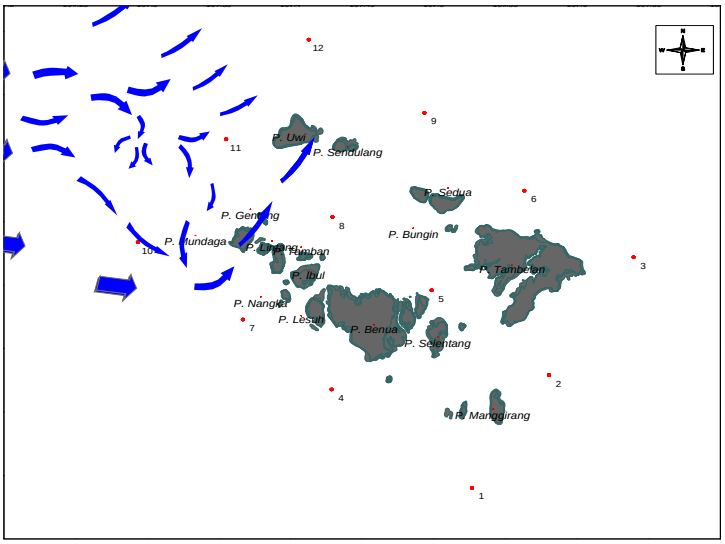

Figure 6. The pattern of flow in tidal conditions in the waters Tambelan during the study in November 2010.

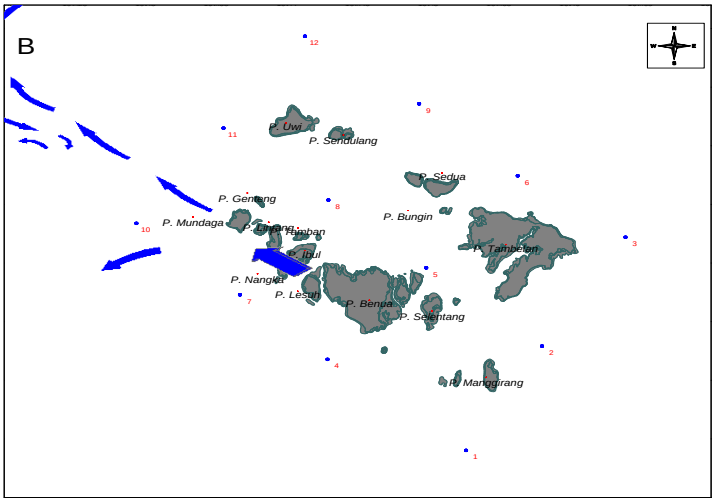

Figure 7. Flow pattern on the conditions in the waters recede during the study month Tambelan November 2010.

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