# PROCEEDING

## The 2nd International Seminar of Basic Science

## Natural Science For Exploration The Sea-Island Resources

Ambon, May 31st 2016

Organized by

Faculty of Mathematics and Natural Science

Pattimura University

# PROCEEDINGS

The 2nd International Seminar of Basic Science

*"Natural Science for Exploration The Sea-Island Resources"*

Poka-Ambon, 31st May 2016

**Mathematic and Natural Science Faculty**
**Universitas Pattimura**
**Ambon**
**2016**

# PROCEEDINGS

The 2nd International Seminar of Basic Science
May, 31st 2016

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# Welcoming Address By The Organizing Committee

Today, We have to thank the The Almighty Allah SWT for the implementation of this international seminar. This is the second seminar about Basic Science in The Faculty of MIPA Pattimura University. The seminar under the title "Natural Sciences for Exploration the Sea-Island Resources" will be carried out on May 31st 2016 at Rectorate Building, Pattimura University. There are 200 participants from lecturers, research institute, students, and also there are 34 papers will be presented.

My special thanks refer to the rector of Pattimura University and the Dean of MIPA Faculty, Prof. Dr. Pieter Kakissina, S.Pd., M.Si. I also would like to express my deepest gratitude to Prof. Amanda Reichelt-Brushett, M.Sc., Ph.D. ; Kazuhiko Ishikawa, Ph.D. ; Nicolas Hubert, Ph.D. ; Prof. Dr. Kirbani Sri Brotopuspito ; Prof. Dr. Marjono, M.Phil. ; Gino V. Limon, M.Sc., Ph.D. as the keynote speakers.

The last, We hope this international seminar usefull for all of us, especially Mollucas People and very sorry if any mistake. Thank you very much.

**Dr. La Eddy, M.Si.**
Chairman of Organizing Committee

# Opening Remarks
# By Dean of Mathematic and Natural Sciences Faculty

I express my deepest gratitude to The Almighty God for every single blessing He provides us especially in the process of holding the seminar until publishing the proceeding of International Seminar in celebrating the 18th anniversary of MIPA Faculty, Pattimura University. The theme of the anniversary is under the title "Natural Sciences for Exploration the Sea-Island Resources". The reason of choosing this theme is that Maluku is one of five areas in Techno Park Marine in Indonesia. Furthermore, it is expected that this development can be means where the process of innovation, it is the conversion of science and technology into economic value can be worthwhile for public welfare especially coastal communities.

Having the second big variety of biological resources in the world, Indonesia is rich of its marine flora and fauna. These potential resources can be treated as high value products that demand by international market. Basic science of MIPA plays important role in developing the management of sustainable marine biological resources.

The scientific articles in this proceeding are the results of research and they are analyzed scientifically. It is expected that this proceeding can be valuable information in terms of developing science and technology for public welfare, especially people in Maluku.

My special thanks refer to all researchers and reviewers for your brilliant ideas in completing and publishing this proceeding. I also would like to express my gratefulness to the dies committee-anniversary of MIPA Faculty for your creativity and hard working in finishing this proceeding, God Bless you all.

**Prof. Dr. Pieter Kakisina, S.Pd., M.Si.**
Dean of Mathematic and Natural Sciences Faculty

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Hotel Mutiara Ambon

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# EXPLORATION FOR FISHING AREAS THROUGH SPL (*SUHU PERMUKAAN LAUT*)

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## ABSTRACT

In the development of technology and science, bioresource exploration has been much done either conventionally or with remote sensing through satellite. Exploration activities are used to find out the location of the marine resources, such as the location of the fishing effort, so that exploration becomes efficient. Fishing in the waters area should be known by observing the condition of geography, such as the surface temperature of the water sea. An area has a particular range of waters where fish gather to conduct physiological adaptations against other factors.

The influence of temperature against the fish is in the process of metabolism, the body's activity, swimming speed, and the stimulation of a nerve so that the fish will be very sensitive to temperature changes. SPL (Suhu Permukaan Laut) greatly affect the life in the sea. To find out the SPL oceanographic conditions in the vast waters of Indonesia then conventional methods is very difficult because of need much cost and a long time. SPL can determine areas of potential fish but the SPL could not determine the amount of fish that are in the waters of Indonesia. To know a lot or whether the number of fish in an area of the waters of the oceanographic parameter is required, such as the salinity of the water, light, chlorophyll, and water currents.

***Keywords*:** Exploration for fishing areas, SPL

## INTRODUCTION

During this natural phenomenon become guidelines for traditional fishing in Indonesia in catching fish. In the activity of catching fish in the sea, the classic question that is often leveled at the fishermen, among others, where the fish of the sea be and when to be captured in the abundant quantities, it is among other things due to the effort of catching fish habitat area by looking for the uncertain will have big consequences, namely oil fuel cost is great, the time and effort of the fishermen (Rozady Zainuddin in 2011). Some things are important in the determination of the area of potential fish is by far pengideraan, acoustic methods and knowledge of Oceanography. Current sea surface temperature measurements have been facilitated by the existence of remote sensing technologies that can menyiam permukaaan sea area in synoptic to detect physical changes in sea level that is very dynamic. Satellite image as one of the technology development of the detection of sea surface temperature (SPL) has been used as a reference in the detection area fishing. But in the case of regions catching yellowfin tuna, the need for prudence in the use of the image.

**The Cornerstone of The Theory SPL (Suhu Permukaan Laut)**

Temperature is a physical quantity which States the abundance of heat contained in an object. The water temperature of the sea mainly in the surface layer is very dependent on the amount of heat generated from sunlight (Weyl in Limbong 2008). The temperature of the waters varies both vertically or horizontally. Horizontally the temperature varies according to latitude and vertically according to a depth of. Temperature variation vertically in the waters of Indonesia in General can be distinguished into three layers, namely homogeneous layer (mixed layer) at the top, a layer of thermocline in the central part and the cold layer is at the bottom. Homogeneous layers range up to a depth of 50-70 meters, this happens on a layer pangadukan layer temperature resulting in water being homogeneous (around 28$^{o}$C) thermocline, a layer is the layer in which the temperature dropped quickly to the depth layer, there are 100-200 meters. The cold layer is usually less than 5$^{o}$C, there is at a depth of more than 200 meters (Nontji in Limbong 2008).

Sea surface temperature is affected by the heat of the Sun, the surface currents, cloud, upwelling divergence and convergence, especially in the area of the estuary and along the coastline. Meteorological factors also play a role that is rainfall, evaporation, air humidity, air temperature, wind speed and intensity of solar radiation. The temperature in the waters of the archipelago is generally ranges from 28$^{o}$C–31$^{o}$C. On the location of the common water ascent (upwelling) like in the Banda Sea, surface water temperatures can go down to the cold because water is 25$^{o}$C in the lower layer of uplifted to the surface. Temperatures near the coast are usually a bit higher than the temperature in the offshore (Nontji in Limbong 2008).

The temperature of the sea water is mainly surface water, determined by the warming Sun. The intensity of the Sun's warming is changing so that the temperature of the sea water will change according to the change of the intensity of the sun shines. Temperature changes can happen in daily, seasonal, annual and long term. Temperature can affect the photosynthesis in the ocean either directly or indirectly. The temperature directly play a role to control enzymatic chemical reactions in the process of photosynthesis. High temperatures can increase the maximum rate of photosynthesis while indirectly change the hydrological structure column temperature waters in terms of the density of water (water density) that affect the distribution of phytoplankton (Zulkarnaen in Rozady 2011).

## MATERIALS AND METHODS

The approach used in this qualitative descriptive writing is based on the study of librarianship. In the selection of the approach is expected to provide an overview regarding the state carefully or certain symptoms on the object of study.

**Data types and methods of Data**

The data collected in the writing of this is secondary data and data source writing obtained indirectly through the media middleman. Secondary data is generally in the form of evidence, record, or report is finalized in the historical archive (documenter data), whether published or not published. The data collection methods used in writing this is to the method:

a. The study of librarianship, libraries are done with the reading of literature-related literature and writing support, in the form of print and electronic library (internet data).
b. Documentary, study documentary has done by the way read the previous writing

reports as well as articles that are accessible from the internet, books or journals to suit the problem.

**The Procedure For Preparing The Paper**

The preparation of this paper has been through the stages or steps that systematically so that obtained results of the study are complete and structured. As for the measures being undertaken in the writing of this paper is follows:

a. Locate and formulate problems.
b. Searching and selecting data sources of the relevant libraries.
c. Analyze data to answer the problem.
d. Formulating alternative problem solving.
e. Draw conclusions and recommend suggestions.
f. Drafting paper.

## RESULTS AND DISCUSSION

Sea surface temperature distribution in April 2012 shows that SPL in waters ranging between Sinjai 30.76-32.25 oC with dominant temperature is 31.26-31.75$^{o}$C spread almost evenly across the area waters Sinjai and the waters of the Bone, the highest temperature ranges between 32,01-32.25$^{o}$C. Whereas the lowest temperature ranging between 31.00-30.76$^{o}$C spread almost all over the waters of Sinjai. The dynamics of the productive zone tersebuttampaknya influenced the pattern of flow of the work and the distribution of the SPL in the waters (Zainuddin et al. in Indrayani). Indrayani delivered back that potential arrest zone small pelagic fish for February shows that SPL in Sinjai ranging between 29.01-31.00$^{o}$C with dominant temperature 29.51-30.00$^{o}$C spread almost evenly across the area waters of Sinjai, the distribution of the highest temperatures ranging between 31.00-30.75$^{o}$C in the northern waters of the Bone. Whereas the lowest temperature range between 29.01-29.25$^{o}$C scattered in the waters of Sinjai and almost contained throughout the waters of the Bay of Bone.

The results of measurements of temperature, salinity, sea surface current velocity and chlorophyll-a indicates a positive correlation with the catch, i.e. amounting to 62%. This shows that the existence of a significant relationship between the catch with oceanographic factors.

Sea surface temperature calculation can be using the formula found in the ATBD-MOD-25, Sea Surface Temperature, i.e., Infrared Thermal Algorithms:

modis_sst = c1 + c2 * T31 + c3 * T3132 + c4*(sec(θ) -1) * T3132 where:
T31 = temperature brightness channel 31,
T3132 = brightness temperature difference (channel 32-channel 31), Θ = zenith satelit corner

**Catch of Fish**

Nontji (in Kurniawati 2015.) says that the cobs, kuweh, trevally, song, bloated and teri more or less influenced by the presence of plankton as a main dish. Small pelagic fish is a fish that always perform the migration in search of food or to conduct spawning. Small pelagic fish migrate looking for temperatures that can be tolerated by his life. Therefore, the accumulation of chlorophyll-a concentration has no effect on small pelagic fish sets the

scene of his life.

## CONCLUSION

Sea surface temperature is related significantly to explain variations of the catch of fish. The results of the analysis it was concluded that the temperature of the sea surface effect is significant in explaining the pattern of distribution of potential fishing areas.

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