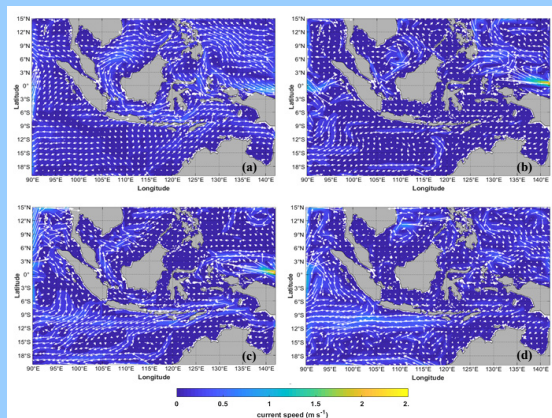


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The average surface current velocity in the months: (a) January, (b) April, (c) July, and (d) October 2013.

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**SEAGRASS CONDITION AT SOME SMALL ISLANDS
IN THE TAKA BONERATE NATIONAL MARINE PARK,
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Chairun Annisa Aryanti, Heny Suseno, Muslim, Wahyu Retno Prihatiningsih, & Mohamad Nur Yahya

INTRODUCTION OF EDITORIAL

Jurnal Segara is scientific journal published and funded by the Marine Research Center, The Agency for Marine & Fisheries Research & Human Resources, Indonesian Ministry of Marine Affairs & Fisheries.

Jurnal Segara Volume 17, Number 3, December 2021 is the third edition of Fiscal Year 2021. The articles contained in Jurnal Segara are the results from research and conceptual studies related to the marine and fisheries issues, conducted by researchers, academics, students, and observers from Indonesia and around the world.

In this edition, the journal features seven scientific research articles on: The Movement of Plastic Marine Debris in Indonesian Seas Using A Trajectory Model; A New Oceanographic Data Portal: Padjadjaran Oceanographic Data Centre (PODC); Determination of ^{137}Cs In Batam Water As South China Sea Extension using Ammonium Phosphomolibdate (AMP) Method; Modeling of Plastic Debris Particle Trajectory During Pre and Post Reclamation in Jakarta Bay; Semi-Automatic Classification Model on Benthic Habitat using Spot-7 Imagery in Penerusan Bay, Bali; Concentration of Natural Radionuclide and Potential Radiological Dose of ^{226}Ra to Marine Organism in Tanjung Awar-Awar, Tuban Coal-Fired Power Plant.

It is hoped that this scientific journal can contribute to the development of Indonesia marine science and technology. Finally, the Editor would like to thank the infinite participation of the researchers scientific for contributors this journal.

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THE MOVEMENT OF PLASTIC MARINE DEBRIS IN INDONESIAN SEAS USING A TRAJECTORY MODEL

Engki A. Kisnarti, Nining Sari Ningsih, Mutiara R. Putri, & Nani Hendiarti

ABSTRACT

There are many studies on ocean currents transporting plastic marine debris using hydrodynamic models and trajectories that have been carried out. However, it is still constrained to be applied in Indonesian waters. Therefore, this research aims to obtain the movement patterns of plastic marine debris, influenced by the dynamics of currents in Indonesian waters using hydrodynamic and trajectory models. The methodology used in this research is to use the HAMBURG Shelf Ocean Model (HAMSOM) numerical model and the trajectory model. Plastic marine debris is assumed to be conservative particles at sea level with a macro size (2.5 cm-1 m). The particles are released in 6 coastal cities (Manado, Balikpapan, Makassar, DKI Jakarta, Semarang, and Denpasar) at the month and stop at the end month (January, April, July, October). The results showed that particles originating from 6 coastal cities moved along the current to the surrounding areas only, across islands within the Indonesian territory, and even left Indonesian territory.

Keywords: Plastic marine debris, current, the trajectory model.

A NEW OCEANOGRAPHIC DATA PORTAL: PADJADJARAN OCEANOGRAPHIC DATA CENTRE (PODC)

Ibnu Faizal, Noir P. Purba, Darryl A. Valino, Madihah J. Sidik, Amarif Abimanyu,
Tonny Bratasena, Fajri Ramdhani, & Ajeng Wulandari

ABSTRACT

Understanding the physio-chemical oceanic and atmospheric processes is critical in monitoring climate change. Archipelagic and Small Island countries are vulnerable to the detrimental effects of climate change, and open access oceanic databases can solve data limitations leading to further development of action plans and government policies. A website was developed (www.isea-podc.org) to distribute and augment free oceanographic data based on various in-situ sampling instruments. Oceanographers review the data collected and stored in the portal. It is led by the Marine Research Laboratory (MEAL), Padjadjaran University, in partnership with Marine Science Institute (MSI), University of the Philippines. This framework supplements information that can support marine ecosystems, fisheries, and climate science studies. Furthermore, all data are accessible to not only the academe but also decision-makers in all aspects. The data sources are student research and the new instruments (RHEA and ARHEA) developed by MEAL. In the future, the portal will be integrated with other government institutional data to provide other functional features and can yield network-wide analyses. In the next phase, collaboration from ASEAN countries should be conducted to gain more impact and provide robust datasets.

Keywords: Ocean Data, Indonesia Seas, Oceanographic Condition, RHEA-ARHE.

DETERMINATION OF ^{137}Cs IN BATAM WATER AS SOUTH CHINA SEA EXTENTION USING AMMONIUM PHOSPHOMOLIBDATE (AMP) METHOD

**Wahyu Retno Prihatiningsih, Heny Suseno, Murdahayu Makmur, Untara, Abarrul Ikram,
M. Nur Yahya, Yogi Priasetyono, & Deddy Irawan P. P.**

ABSTRACT

A Study of the determination of ^{137}Cs has been carried out in Batam Water. The South China Sea, through several straits, is connected to the Pacific Ocean region and the Indonesian Sea. The mass of Pacific water entering the South China Sea will reach Batam Water with radioactive contaminants. Batam Water is part of Karimata Strait, which is the Extension Line of the South China Sea, making this potentially receive ^{137}Cs of radioactive contaminants from operational nuclear reactors discharged from the regional area. The purpose of the study is to obtain the current status of ^{137}Cs activity concentration as a baseline data to minimize the impact of nuclear activities on the ecosystem of Batam Water, Indonesia. The ^{137}Cs determination method uses the AMP with modification of base dissolution and measurement validation with Certified Reference Material (CRM). The activity concentrations of the ^{137}Cs in Batam seawater ranged from <0.03 to $0.35 \pm 0.02 \text{ Bq.m}^{-3}$, while the activity concentrations of ^{137}Cs in the sediments were up to $0.22 \pm 0.08 \text{ Bq.kg}^{-1}$ with ^{137}Cs below Minimum Detectable Activity (MDA). The results suggest that the activity concentrations of ^{137}Cs in seawater and sediments are comparable to previous researches related to the presence of radiocesium in the region.

Keywords: Batam Water, South China Sea, ^{137}Cs , Ammonium Phosphomolibdate (AMP) Method.

**MODELING OF PLASTIC DEBRIS PARTICLE TRAJECTORY
DURING PRE AND POST RECLAMATION IN JAKARTA BAY**

Edwin Apriyanta Winardi, Mutiara Rachmat Putri, Muhammad Reza Cordova, & Agus Setiawan

ABSTRACT

The primary source of environmental problems in Jakarta Bay's waters is the change in hydrodynamics caused by reclamation and land-derived waste from the 13 watersheds that discharge into the bay. In June and December 2006 and 2015, hydrodynamic and trajectory simulations were conducted in Jakarta Bay to determine the distribution of plastic debris in pre- and post-reclamation conditions. The hydrodynamic conditions and particle trajectory in Jakarta Bay were described numerically using the Hamburg Shelf Ocean Model (HAMSOM). Secondary tidal data and primary ADCP data are used to validate the simulation results. The distribution of plastic debris released during the simulation depicts a distribution that follows the monsoon pattern, moving west during the east monsoon and moving east in the west monsoon and spreading along the coastline in both conditions. The percentage of plastic debris increased by 21.42% in June and 4.07% in December. The increase in the percentage of plastic debris that remains in the waters of Jakarta Bay is due to a 0.03 - 0.05 m/s decrease in current velocity following the formation of the reclamation island. Due to the decrease in current velocity within the bay, trajectory simulations indicate that plastic debris will take an additional 69.52 – 304.25 hours to exit. The accumulation of plastic debris around the reclamation islands demonstrates that the islands act as waste traps, necessitating proper waste cleanup, particularly in the canal area and around the reclamation island..

Keywords: Hydrodynamic and trajectory model, plastic debris, reclamation, Jakarta Bay.

SEMI-AUTOMATIC CLASSIFICATION MODEL ON BENTHIC HABITAT USING SPOT-7 IMAGERY IN PENERUSAN BAY, BALI

Devica Natalia Br Ginting & Anang Dwi Purwanto

ABSTRACT

Benthic habitats are one of the interesting marine resources and its existence must be preserved. Provision of up-to-date benthic habitat information requires a relatively large amount of time and money. The use of remote sensing technology is one of the best solution. This study aims to develop a semi-automatic processing model that is fast, accurate, and with broad spatial coverage. The satellite image data used is the SPOT-7 image acquired on April 11th, 2018. The method used is a supervised classification with a decision tree algorithm. The analysis was carried out using a script developed in the open-source R application. The results showed that the model used was able to accelerate the processing of benthic habitat extracted from the initial process to the classification. The model developed is able to classify habitat classes based on the training sample data provided so that it does not affect the user's ability to determine the habitat class. The resulting model accuracy is 93.6%. The validation of the resulting classification showed an overall accuracy of 59% and a kappa accuracy of 0.46. It is necessary to carry out further research by increasing quality and quantity of training samples from each object of benthic habitats and developing scripts in order to produce better mapping accuracy.

Keywords: Benthic habitat, semi-automatic, decision tree, SPOT-7, Penerusan Bay.

CONCENTRATION OF NATURAL RADIONUCLIDE AND POTENTIAL RADIOLOGICAL DOSE OF ²²⁶Ra TO MARINE ORGANISM IN TANJUNG AWAR-AWAR, TUBAN COAL-FIRED POWER PLANT

Chairun Annisa Aryanti, Heny Suseno, Muslim, Wahyu Retno Prihatiningsih, & Mohamad Nur Yahya

ABSTRACT

Fly ash and bottom ash from coal combustion can contain natural radionuclides with a certain concentration. The release of fly ash into the environment can potentially increase the concentration of natural radionuclides in the surrounding environment, including marine waters. This study aimed to determine the activity of natural radionuclides in seabed sediments and the radiological impact on marine organisms related to Tanjung Awar-Awar Coal-Fired Power Plant activities in Tuban. The sampling techniques were carried out by the purposive sampling method. The concentration measurement of natural radionuclide activity was carried out using HPGe detector gamma-ray spectrometry at marine radioecology laboratory of National Nuclear Energy Agency. The detected concentration of natural radionuclide activity was ⁴⁰K ranging from 159.18 to 365.88 Bq.Kg⁻¹, ²²⁸Ac ranging from 14.47 to 28.05 Bq.Kg⁻¹, and ²²⁶Ra ranging from 15.00 to 67.65 Bq.Kg⁻¹. By using the ERICA Assessment Tool Tier 2 program, the results of the analysis showed that there was no impact of ²²⁶Ra radiation on marine organisms at the research site because the total radiation dose rate (external + internal) of ²²⁶Ra on marine biota was lower than the screening level of 10 µGy / h. Thus, it will not harm marine ecosystems and the sustainability of marine organisms in the waters of Tanjung Awar-Awar Coal-Fired Power Plant, Tuban.

Keywords : Natural radionuclides, ERICA Tool, sea bed sediment, coal-fired power plant, Tuban waters.