Resume

Personal details

Name	Ahmad Dhuha Habibullah	
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Education

Aug 2020 - Jul 2022

Institut Teknologi Bandung
Master of Science in Earth Science
Thesis: "Analyzing Marine Heatwaves in Indonesia (1982-2020)", contributing to advanced understanding of climate dynamics.
Developed expertise in data analysis, climate variability, and environmental monitoring.
GPA 3.63

Aug 2015 - Aug 2019

Universitas Bengkulu
Bachelor of Science in Physics

- Undergraduate Thesis: "Development of a Microcontroler-Based Solar Irradiance Monitoring Instrument using Photovoltaic Panel"
- Acquired proficiency in electronics, programming, and analytical troubleshooting
GPA 3.41

Employment

Sep 2022 - Aug 2023

System Integration Officer
PT SIBACIPTA TELEKOMINDO, Jakarta
Assisted in installing Marine Automatic Weather Stations (MAWS) by conducting site surveys, designing custom brackets for port deck specifications, guiding clients on site selection, coordinating with suppliers for bracket fabrication, and supporting installation teams for smooth deployment.

Sep 2023 - Aug 2024

Project Management Officer
PT SIBACIPTA TELEKOMINDO, Jakarta
Optimized project schedules for timely deliveries, managed Marine Automatic Weather Station installations to ensure smooth deployments, and supported business development by identifying potential project opportunities.

Sep 2024 - Present	**Marine-Meteorological Specialist** **PT SIBACIPTA TELEKOMINDO, Jakarta** Assisted in installing and maintaining marine meteorological systems to ensure proper sensor and equipment functionality, prepared daily marine weather forecasts for clients, and monitored radar data to support forecasting efforts.

Publications

2021	**Sea surface temperature variability in Indonesia and its relation to regional climate indices** **IOP Conference Series: Earth and Environmental Science**

Abstract
Sea surface temperature (SST) is an essential indicator of ocean condition. It can reveal many physical processes interacting with it. The present study aims to investigate the spatial-temporal pattern of significant SST variability in Indonesia seas. The Empirical Orthogonal Function (EOF) and Power Spectral Density (PSD) are used to analyze monthly SST data from 1979 to 2021. These two methods are combined with correlation analysis to verify the underlying phenomena and their spatiotemporal distribution pattern using regional climate indices as the reference signal. The result shows that the most prominent feature is the annual and semi-annual oscillation due to the Asia-Australia monsoon system. The annual oscillation signature is found almost in the entire Indonesian seas, with an exception in the low-latitude area and the western Pacific region. The signature of semi-annual oscillation is also protrusive, extending across Indonesia from the Timor Sea to the South China Sea. There is also a variation of SST in correlation with Dipole Mode Index (DMI), localized on the western coast of Sumatra.

2021	**A Simple and Inexpensive Irradiance Monitoring System Using Photovoltaic Panel** **AIP Conference Proceedings, 2320 (1)**

Abstract
The sun has an important role in the lives of all beings on earth. Monitoring of solar irradiance is important because the data correlates with many disciplines. This research aimed to develop an irradiance monitoring instrument that has the ability to monitor the using a photovoltaic panel as the sensor. The principle of this instrument is that the photovoltaic panel produces electricity if it is exposed to direct sunlight and its output is proportional to the irradiance. The output is read by a microcontroller and it is calculated using an algorithm to estimate the irradiance value. This study is started by designing the hardware both the electronic parts including a microcontroller, radio transceiver, data logger, and the mechanical parts including the pole and the active solar tracker. The software is designed and developed using the Arduino IDE. Generally, the result shows that the photovoltaic panels can be used as a sensor to measure the irradiance. The maximum irradiance in Bengkulu during the test is 988.41 W/m2. The root mean square errors (RMSE) of the measurement compared to the standard instrument is about 14.06 which is acceptable. However, from this study, it is suggested to use good quality materials as it is an outdoor instrument that needs to be tough and durable.

2023	**Effect of Marine Heatwaves on Coral Bleaching in Lombok Waters**

Journal of Marine Science and Engineering, 11 (1), 161

Abstract
Ocean temperatures increased during the 20th century and are predicted to continue to rise during the 21st century. Simultaneously, the extreme phenomena of shorter time ocean warming, known as Marine Heatwaves (MHWs), are also taking place. The present study used the Daily Optimum Interpolation Sea Surface Temperature (DOISST) v2.1 with a spatial resolution of 0.25˚. The time period of the DOISST data used in this study was from January 1, 1982 to December 31, 2020, and the region was 90° E–150° E and 16° S–16° N, which is divided into 11 Fishing Management Areas (FMAs). MHWs have a set of metrics derived from the SST data to describe the statistical characteristics of each event. To examine and quantify the influence of the Pacific Ocean and the Indian Ocean, we used the Niño 3.4 SST index and the Dipole Mode Index (DMI), respectively. Based on the data analysis, there has been an increase in the duration and frequency of the occurrence of MHWs in the study area, with the highest increase occurring in FMA 573, FMA 716, and FMA 711. Based on the severity, MHWs in Indonesia are dominated by category I, which is dominantly located in FMA 716, category II in FMA 573, category III with the center of events in FMA 771, and category IV with irregular spatial patterns.

2023

Effect of Marine Heatwaves on Coral Bleaching in Lombok Waters
IOP Conference Series: Earth and Environmental Science, 1350 (1), 012037

Abstract
Coral reefs are fragile and endangered ecosystems in the tropical marine and coastal environment. Thermal stress induced by marine heatwaves (MHWs) can significantly harm coral health, leading to bleaching of the coral ecosystem. This study aims to quantify coral bleaching intensity in the Lombok region over recent decades, by analyzing MHWs intensity data derived from satellite-measured SST. In 1998, the coral reef area reached its peak with 36,550.71 ha. There was a sharp decline in 1999, reaching the lowest point at 4,865.76 ha. A significant increase was observed until a new peak in 2018 with 23,120.19 ha. The Western region experienced a significant increase from 1998 to 2018, followed by a decline. The Eastern Region showed significant fluctuations but generally trended upwards until 2018, followed by a sharp decline in 2019-2022. The Southern Region also experienced fluctuations, with an increase until 2018, followed by a significant decrease until 2022. The Northern Region showed a stable trend until 2016, then experienced a significant decline in 2017, and increased again in 2018. However, in subsequent years, the coral reef area in the Northern region remained relatively stable. Factors such as changes in sea surface temperature, human activities (e.g., overfishing or pollution), and climate change may have contributed to these fluctuations in the coral reef area on Lombok Island.

2024

Interannual Variability of Sea Level Anomaly (SLA) in the Western Sumatra Coastal Waters Driven by ENSO and IOD Modulations
Asian Journal of Aquatic Sciences, 7 (3), 422-431

Abstract
This study aims to investigate the interannual variability of Sea Level Anomaly (SLA) along the western coast of Sumatra waters, focusing on the influences of the El Niño-Southern Oscillation (ENSO) and the Indian Ocean Dipole (IOD) in modulating SLA patterns. Using 31 years (1993-2023) of a gridded dataset from Copernicus Marine Service (CMS) and climate indices as the reference, the

interplay between SLA and climate modes (ENSO and IOD) was determined through lag/lead correlation and spatial distribution analysis. The analysis shows a clear inversive relationship between ENSO and SLA, with a one-month delayed negative correlation (r= -0.41), indicating that SLA increases during the La Niña phase due to shifting in atmospheric and oceanic conditions. Similarly, SLA exhibits a negative correlation with DMI (r= -0.46) without any lag, suggesting a rapid response of SLA to IOD. Spatial analysis further demonstrates that ENSO and IOD most strongly influence SLA along Sumatra's coast within the first 1–3 months. These findings reveal that ENSO and IOD modulate SLA variability with distinct spatiotemporal characteristics, providing crucial insights for understanding coastal dynamics and enhancing mitigation strategy for sea level-related disasters in the western coastal region of Sumatra

2025

Leveraging the Ubiquitous GPS Sensor on Smartphones for Accessible Land Surveying
Indonesian Physical Review, 8 (2), 366-376

Abstract
The Global Positioning System (GPS) is an essential tool in land surveying. GPS has become an alternative method of surveying that requires less manpower and less time. However, GPS devices are still expensive to buy, especially for students. On the other hand, almost every student has a smartphone with a built-in GPS sensor, so this GPS is certainly accessible to everyone with a smartphone. This study used a smartphone's GPS to conduct land surveying at the campus of Bengkulu University. This smartphone's GPS was used to track various parameters such as coordinates, elevation, and distance between two or more points to calculate the area within the study area. The innovative method of using the built-in GPS sensor in smartphones will provide convenience for users and introduce simplified open-source software for the land measurement process. The measurement was calibrated using a conventional roll meter to verify the linear error by comparing the two measurements between the smartphone's GPS and roll meter. The smartphone's GPS reading was logged using GPS Waypoints and My Tracks, free Android applications on the Google Play store. This study's average error in measurements obtained using GPS on smartphones was 3.02%. This value is sufficient for the initial stage of low-cost land surveys and falls within ideal conditions for GPS measurements. Therefore, this article emphasizes the potential of smartphone GPS to optimize techniques in education and scientific investigations.

2025

Impact of Marine Heatwaves and Cold Spells on Coral Reef Ecosystem in a Tropical Region: A Case Study of Lombok Waters, Indonesia
Marine Systems & Ocean Technology, 20 (1), 16

Abstract
Coral reefs, vital marine ecosystems, are highly vulnerable to thermal stress-induced bleaching. Regional-scale bleaching events are often triggered by elevated sea surface temperature (SST) associated with global warming. While sustained temperature anomalies exceeding ± 1 °C above the long-term maximum monthly mean can induce bleaching, extreme short-term warming and cooling events, known as marine heatwaves (MHW) and marine cold spells (MCS), respectively, pose significant threats. These events, characterized by prolonged periods of anomalous temperature extremes, can have far-reaching ecological and economic consequences. This study investigated the spatial distribution of MHW and MCS in the Lombok Sea and their relationship with coral bleaching. Using daily SST data from 1998 to 2022, we identified MHW and MCS

events and analyzed their frequency, intensity, and duration. Additionally, Landsat imagery (Landsat 5, 6, and 7) and field surveys conducted in 2016 were employed to assess changes in coral cover over time. Our results show that the effect of MCS and MHW cause coral bleaching, particularly in years with high frequency, intensity, and duration of these events. Extreme daily intensity (anomaly of SST > 1.5 °C) of MCS in 2000 and MHW in 1998, 2016, and 2022 led to a significant decrease in coral reef cover of approximately 30%. Furthermore, we observed that large-scale climate patterns such as the El Niño-Southern Oscillation (ENSO) can exacerbate MHW (in 1998 and 2016) conditions and contribute to coral decline. These results underscore the urgent need for effective coral reef manage ment strategies to mitigate climate change and ocean warming impacts.

Courses

Oct 2020	**Python for Earth Data Processing**
	Implementing large earth dataset processing with Python
Feb 2022	**Marine Survey Equipment Operation and Field Survey Training**
	Operating marine survey equipments and conducting field survey in Cirebon, Indonesia
Aug 2023	**CAWO-Modelling Local Training**
	Operating Coupled Ocean, Atmosphere, Wave and Ocean Modeling for BMKG weather forecast in Jakarta, Indonesia
Aug 2024	**Weather Radar Factory Training for Meteorologist**
	Monitoring and understanding weather radar data for producing forecast products in Huntsville, AL, USA

Languages

Indonesian	Fluent
English	Good

Skills

Programming	Moderate
Project Management	Moderate
System Integration	Moderate