10 March 2025

English

United Nations Group of Experts on Geographical Names
2025 session
New York, 28 April – 2 May 2025
Item 5(a) of the provisional agenda *
Technical expertise: Names collection, office treatment, features beyond a single sovereignty and international cooperation

Contribution of Indonesia to undersea feature naming: cultural heritage and maritime implications

Submitted by Indonesia**

Summary:

The Republic of Indonesia, as one of the world's largest archipelagic nations, occupies a strategic geographical position and aspires to establish itself as the world's maritime axis, with the sea serving as the backbone of its national maritime activities. The dissemination of accurate and detailed information on natural undersea features is crucial to ensuring maritime navigation safety, a cornerstone of these activities.

In line with Presidential Decree No. 164 of 1960, Presidential Regulation No. 62 of 2016, and the International Convention for the Safety of Life at Sea (SOLAS) 1974, Pushidrosal, as Indonesia's national hydrographic authority and a member of the International Hydrographic Organization (IHO), bears the responsibility of supporting maritime safety in national waters. This role encompasses the provision of critical hydro-oceanographic data, which is reflected in nautical charts, navigational publications, and updated maritime warnings.

In collaboration with various ministries and institutions, the Hydro-Oceanographic Center of the Indonesian Navy has identified and classified 83 undersea features, which have been submitted to the Sub-Committee on Undersea Feature Names (SCUFN) of the General Bathymetric Chart of the Oceans (GEBCO) and included in Indonesia's official maritime charts. These discoveries were made during the Jala Citra expeditions conducted in Halmahera and Papua waters (2021), Banda Sea (2022), and Flores Sea (2023), utilizing advanced survey vessels KRI Spica-934 and KRI Rigel-933. These expeditions involved multidisciplinary teams of academics and researchers specializing in hydrography, geology, geophysics, meteorology, oceanography, geosocial studies, and defense and security.

Significant achievements include the acceptance of 8 underwater features by SCUFN at its 35th session in Paris, France (March 2022), 41 features at the 36th session in

* GEGN.2/2025/1

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Wollongong, Australia (November 2023), and an anticipated 34 features at the 37th session in Jeju, Korea (March 2024).

The naming of undersea features follows rigorous guidelines, considering local cultural heritage, regional languages, names of national heroes, associated villages, and nearby geographic entities. For instance, the "Kabaresy Ridge," discovered in the Banda Sea, derives its name from the Maluku language, where "Kabaresy" symbolizes bravery. Another example is the "Skaro Kacil Seamount," where "Skaro" references a reef in the Maisel Islands of Maluku Province, and "Kacil" means small in the local language.

Pushidrosal emphasizes the importance of these names, as they represent not only the geological structure of the seabed but also carry significant implications for maritime safety, environmental protection, economic interests, territorial sovereignty, historical context, and political considerations.

Indonesia's Contribution to Undersea Feature Naming: Cultural Heritage and Maritime Implication

The seafloor features constitute a component of the broader panorama of the oceanic substratum or its morphology, resembling terrestrial landforms such as mountains, volcanoes, slopes, plains, valleys, trenches, and channels. These morphological formations are typically linked to geological processes that shape and develop them, either independently or in groups (clusters). According to Indonesia's bathymetric map, the evolving patterns reveal that the seafloor's morphology aligns with the coastline and tectonic features (Salahudin, 2010).

The Multibeam Echosounder or Side Scan Sonar provides extensive coverage, facilitating the detection of undersea features and offering critical insights into seafloor classification. In some instances, detecting specific features takes precedence over bathymetric data acquisition. Identified undersea features typically require further examination to ascertain their position and depth accurately (IHO, 2005).

Several notable locations were investigated during the 2021 Jala Citra 1 (AURORA 1) expedition. One of these historically significant sites was the Sayang Shoal, based on Indonesia’s Notice to Mariners (BPI) No.11/152 (P) from 1955 and BPI No.26/206 from 1959, which identified a substantial undersea anomaly approximately 15 nautical miles in width, with an area extending one nautical mile in radius exhibiting "boiling mass" characteristics reaching the seafloor, thereby designating it a hazardous zone (undersea disturbance) (Figure 1). The BPI also recorded the presence of various shoals. The first is Jiew Shoal, located near Jiew Island, one of Indonesia’s outermost islands in the Maluku Province. The second is Aurora Bank, situated between Jiew Island and Sajang Island.

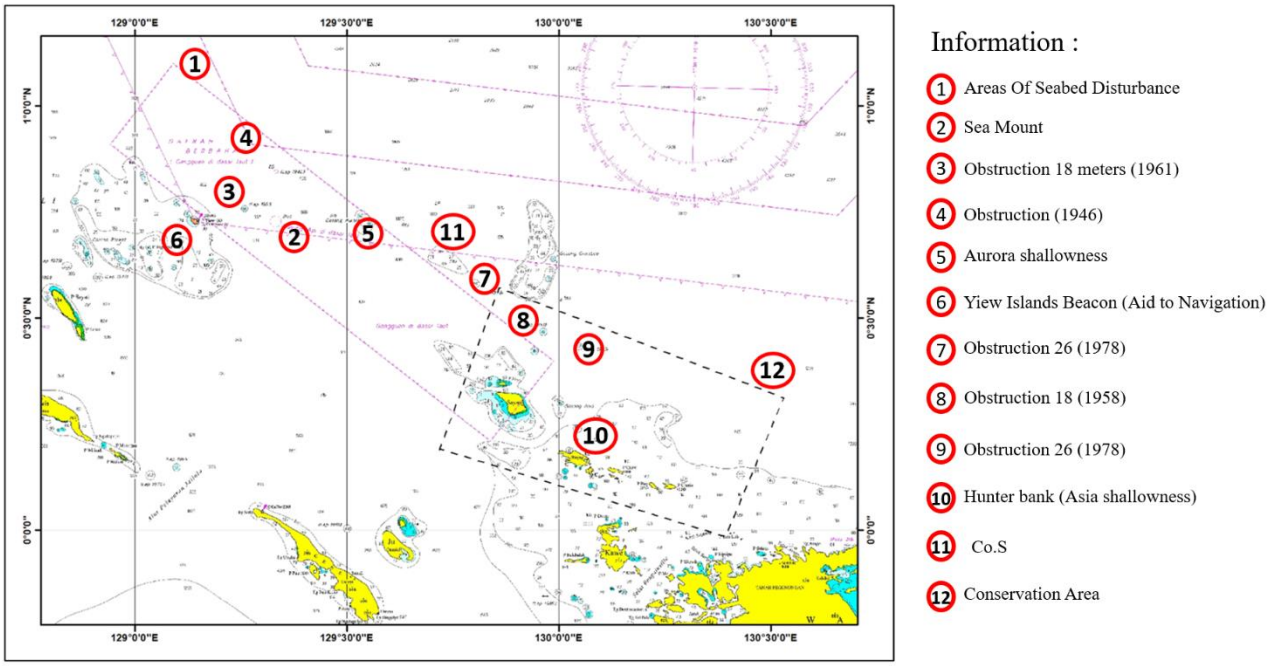


Figure 1. Undersea Features as Navigation and Shipping Hazards During the Jala Citra 1 (AURORA 1) Expedition in 2021
(Source: Indonesia Maritime Map No.402 and BAC No.3922)

In 2022, the Jala Citra 2 and Snellius Expeditions conducted in the Banda Sea were designed to support Indonesia's maritime policy, focusing on the Eastern regions of the country's Eastern region. These align with the development of naval defense capabilities, which aim to enhance the readiness of naval forces. One of the key approaches to achieving this goal is through the provision of marine information and analysis. The results of the investigation revealed six distinct undersea morphological features, five of which rise more than 1,000 meters above the seafloor, and one feature with a height of less than 1,000 meters. Seamount is a morphological formation that rises more than 1,000 meters from the seafloor.

Furthermore, the Jala Citra 3 Expedition in 2023 was conducted to foster collaboration in marine research, aiming for independence, national research advancement, and non-material scientific research. In the Jala Citra 3 Expedition of 2023, data from the Multibeam Echosounder revealed the presence of the Hobal Sea Mount feature at a depth of 83 meters and the "Fan" type undersea feature, Watirar, at a depth of 276 meters, located southwest of Hobal Mountain, approximately 3 km away. Furthermore, the characteristics of the small volcanic island rocks in the Satonda Marine Nature Park (TWAL) in the waters of West Nusa Tenggara were examined. Additionally, several characteristics of the volcanic mountain range in the Wetar Basin, and Flores Sea, were identified, based on morphology, magnetic anomalies, and indications of hydrothermal activity. Other findings in the field of magnetism suggest an increase in magnetic values in some regions of undersea mountains detected during the expedition (Figure 2).

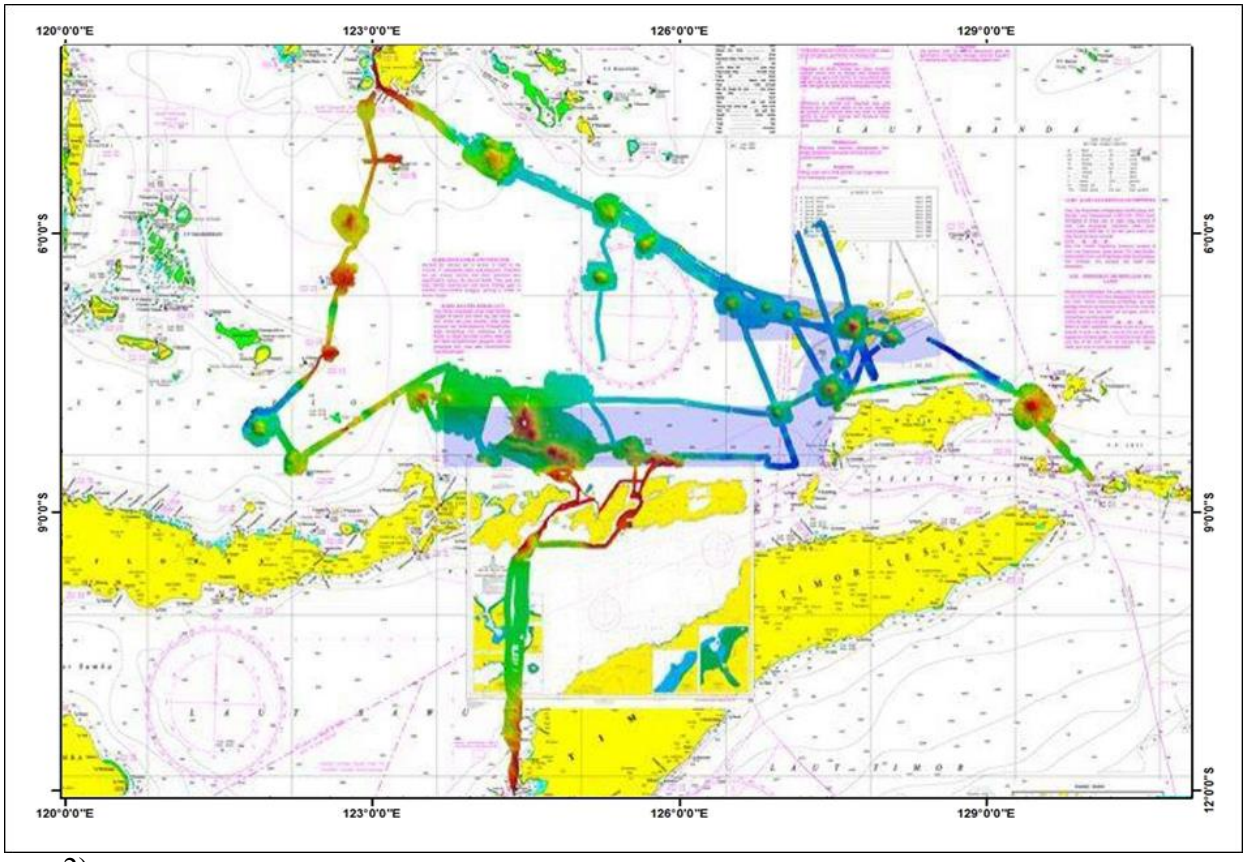


Figure 2. Results of The Undersea Feature Investigation During the Jala Citra 3 Expedition in 2023.

Through the Jala Citra 1, 2, and 3 expeditions, 83 undersea feature objects have been discovered and successfully identified during the analysis and processing of MBES and Backscatter data. Each of these undersea features possesses unique characteristics, as per the criteria established in the IHO-IOC B-6 "Standardization of Undersea Feature Names" publication. This achievement results from the collaboration of the Jala Citra expedition research team, the support of relevant stakeholders, and the application of research methodologies that adhere to established standards. Some of these identified undersea features are detailed in Table 1.

Table 1. Results of The Identification of Various Undersea Feature Objects

No.	Category of Undersea Feature	Number of Identification
1	Bank	3
2	Seamount	33
3	Hill	16
4	Seamount Chain	1
5	Peak	1
6	Saddle	1
7	Mound	5
8	Reef	7
9	Canyon	3
10	Fan	2
11	Plateau	4
12	Basin	2
13	Knoll	1
14	Ridge	2
15	Skare Escarpment	1
16	Valley	1
TOTAL		83

Naming undersea features with consideration for local culture and elements is a prudent approach to maintaining the close relationship between cultural heritage, the natural environment, and geospatial science. This approach enriches local identity, raises cultural awareness and promotes the conservation of marine environments. Local maritime communities can directly apply the naming of undersea features in their daily professions. The validity, authentication, and methods used are strictly maintained to comply with applicable regulations. All selected names must adhere to the principles outlined in the IHO-IOC B-6 publication “Standardization of Undersea Feature Names” and be supported by valid evidence, as specified in the SCUFN Framework's closing section. This approach makes the naming of undersea features not just a list of names but a reflection of a region's historical, cultural, and ecological values.

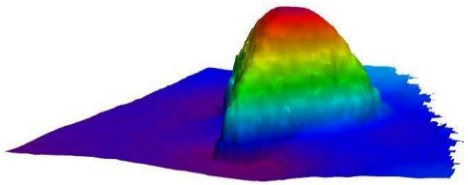
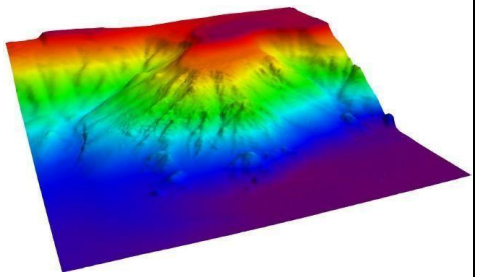
Naming with local wisdom is essential to enrich local identity and raise cultural as well as historical awareness. For example, the name “Kabaresy Ridge” was identified during the Jala Citra Expedition in the Banda Sea, where “Ridge” refers to an elevation with complex characteristics and steep sides, and “Kabaresy” is an indigenous Maluku term meaning bravery. Similarly, “Skaro Kacil Seamount” was also discovered in the Banda Sea, where “Seamount” refers to an elevation more than 1,000 meters above the surrounding relief, and “Skaro” is derived from a coral reef in the Maisel Islands, Maluku Province, located 256 km northeast of the feature. “Kacil” means small in the Maluku language. Another example is the naming of the “Soekarno Seamount Chain,” where “Seamount Chain” refers to a linear or curved alignment of separate seamounts, and "Soekarno" honors Indonesia's first president and independence proclaimer, known for his strong maritime vision. In his 1963 National Maritime Convention speech, Soekarno emphasized that Indonesia must dominate the oceans to become a powerful, prosperous, and peaceful nation.

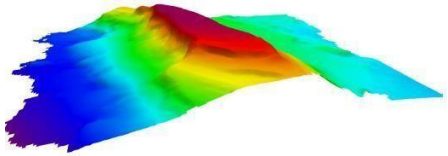
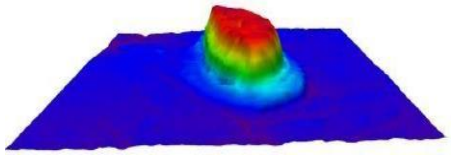
As part of his maritime vision, Soekarno declared September 23 as National Maritime Day and laid the foundation for Indonesia to become a maritime nation, with a focus on the naval and military fleets, and a thriving maritime industry. In tribute to Soekarno, the undersea feature mountain range discovered during the Banda Expedition by Hydro-Oceanographic Center of the Indonesian Navy (*Pusat Hidro-Oseanografi, TNI Angkatan Laut*- Pushidrosal) was named the Soekarno Ridge.

There are many undersea features in Indonesia, more than 1000 objects but only 83 proposals have been submitted and approved by SCUFN. Pushidrosal has mapped the Indonesian maritime areas on analog sea charts, and with advancements in technology, Pushidrosal officially launched the use of Electronic Navigational Charts (ENC) in 2009. This allows the undersea feature names to be displayed automatically on ENC. Pushidrosal emphasizes the importance of naming undersea features to mark significant locations or areas for maritime activities such as navigational safety, marine environmental protection, economic development, territorial integrity, history, and even political matters.

The details of the chronology of naming several undersea features based on the Jala Citra Expeditions, conducted by Pushidrosal in collaboration with ministries, agencies, and academia, have been submitted in the SCUFN proposal and are provided in Appendix 1.

Examples of the Cultural Heritage Undersea Feature Naming in Indonesia

No	Undersea Feature Names	Meaning	Characteristics	View	Type	Location
1	***La Maddukelleng Hill***	La Maddukelleng was a Bugis nobleman who served as the supreme leader of the Wajo region, Bugis tribe, in the 18th century. La Maddukelleng was awarded the title of National Hero of Indonesia for successfully liberating the Wajo and South Sulawesi regions from Dutch colonialism. La Maddukelleng died in South Sulawesi in 1765, and was buried in Sengkang, South Sulawesi.	Maximum Depth 760m Minimum Depth 342m Total Relief 418m Dimensions 2.89 Km2		***Hill*** is a distinct elevation generally irregular in shape, less than 1000m above the surrounding relief as measured from the deepest isobath surrounding most of the features.	Makassar Strait
2	***Balla Lampoa Fan***	Balla Lompoa is a traditional Indonesian house originating from South Sulawesi. Balla Lompoa means a large stilt house which is the residence of the King of Gowa.	Maximum Depth 2153m Minimum Depth 36m Total Relief 2117m Dimensions 111Km2		***Fan*** It is a relatively fine- grained and continuously deepening depositional feature of a sediment source generally located at the lower end of a canyon or canyon system.	Makassar Strait
3	***Pong Tiku Plateau***	Pong Tiku is an Indonesian national hero from South Sulawesi. Pong Tiku was a Torajan nobleman and warlord in the resistance against the Dutch colonialists in 1906. Pong	Maximum Depth 438m Minimum Depth 21m		***Plateau*** plains are A large, relatively flat elevation that is	Makassar Strait

No	Undersea Feature Names	Meaning	Characteristics	View	Type	Location
		Tiku or also known as Ne Baso, died on July 10, 1907 in the Sadan River, Sinki Rantepao, Toraja. He died at the age of 61 and was buried in the Pangala public cemetery, Tana Toraja.	Total Relief 417m Dimensions 314.5 Ha		higher than the surrounding relief with one or more relatively steep sides.	
4	***Badik Reef***	Badik is the name of a traditional Indonesian weapon of the Makassar tribe, South Sulawesi. The badik weapon has a deep meaning in the culture of the Makassar people. Pulling out the badik is not arbitrary but only for several things such as upholding honor (customary law), defending if attacked, protecting the dignity of women and defending leaders or the country.	Maximum Depth 82m		***Reef*** It is a shallow elevation consisting of consolidated material that can Endanger surface navigation.	Makassar Strait