NATIONAL COLLABORATION ON BATHYMETRIC DATA COLLECTION IN INDONESIA

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Deputy of Base Geospatial Information

Geospatial Information Agency

The Role & Function of BIG:

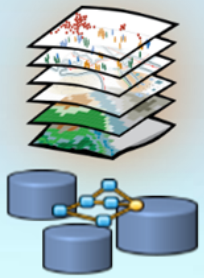
to carry out government duties in the field of Geospatial Information

Satu Peta
Satu Data
Satu Nusantara

BIG has wider duties and functions, not only coordinate and implement activities in surveying and mapping, but also produce the Geospatial Information that can be accounted, accurate, reliable, and easily accessible.

REGULATOR

Formulate policies and prepare laws related to the implementation of development Geospatial Information



EXECUTOR

Single Provider for Basic Geospatial Information (IGD), Article 22.

COORDINATOR

Coordinate the development and integration of Thematic Geospatial Information.

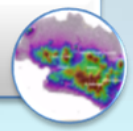
- IGD is a geo-reference frame for IGT to ensure the alignment of National Geospatial Information

IGD Development

Reference of Thematic Geospatial Information Development

- BIG coordinate the preparation of integrated IGT based on the norms, standards, and guidelines set by BIG

IGT Development



Fostering and Integration of Thematic Geospatial Information

- To fulfill the mandate that the Geospatial Information is easily accessible, BIG build JIGN as an umbrella law that strengthens Presidential Decree

IIG Development

Sharing and Dissemination of Geospatial Information

Outline

1. Introduction
2. Importance of Marine Geospatial Information in Indonesia
3. Marine Geospatial Information Availability
4. Strategy of Fulfillment and National Collaboration in Marine Geospatial Information
5. Integrated Base Map in Indonesia
6. Utilization of Marine Geospatial Information
7. Conclusion

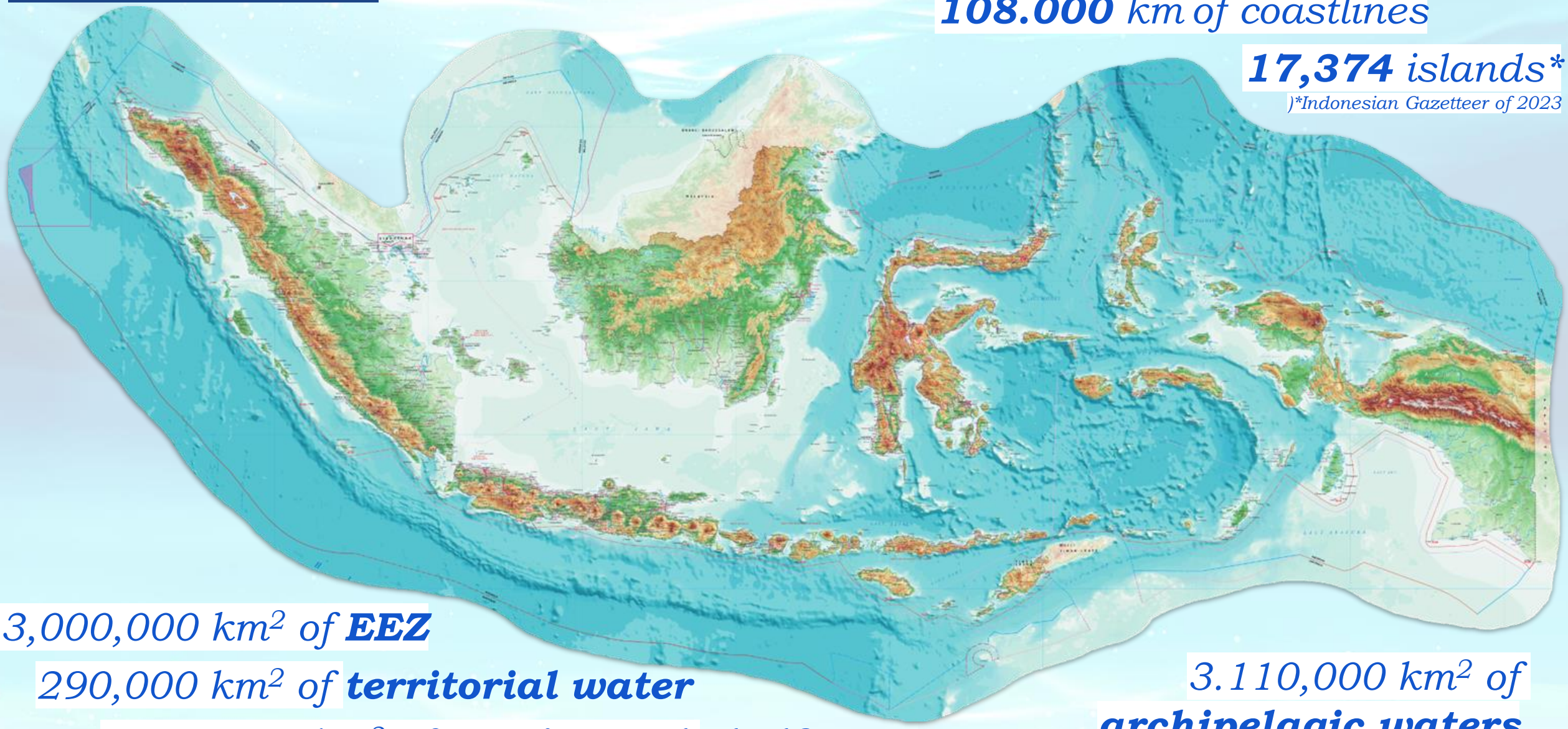
Indonesia

6.400.000 km^2 *of water bodies*

108.000 *km of coastlines*

17,374 *islands**

*)*Indonesian Gazetteer of 2023*



3,000,000 km^2 *of* ***EEZ***

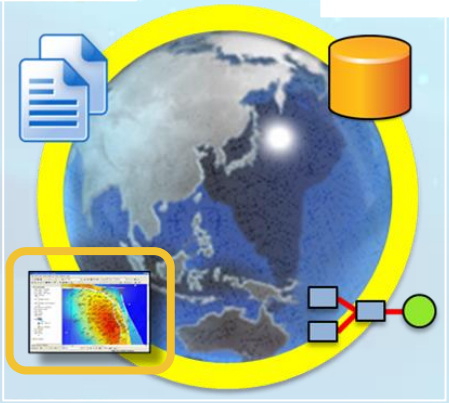
290,000 km^2 *of* ***territorial water***

2.800.000 km^2 *of* ***continental shelf ext.***

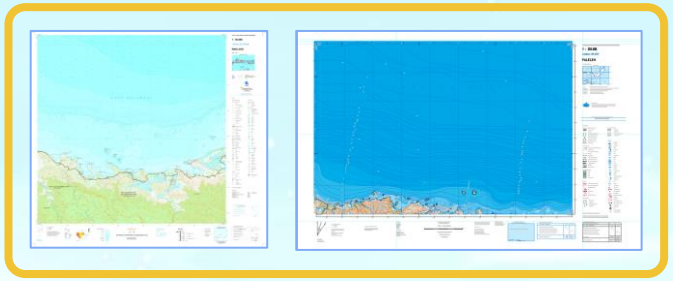
3.110,000 km^2 *of* ***archipelagic waters***

Main Use of National Bathymetric Data and DEM in Indonesia

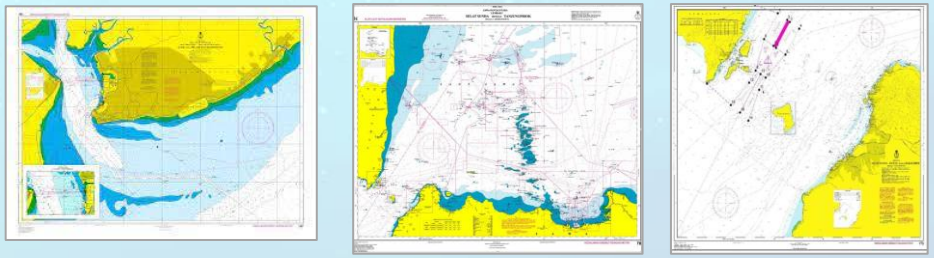
National Bathymetric Data and DEM



Base Map Production

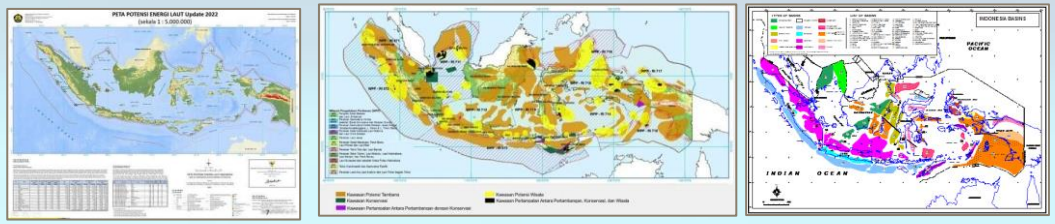


Nautical Chart Production

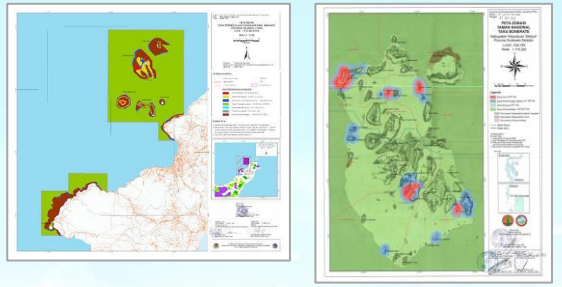


Spatial Planning and Zoning

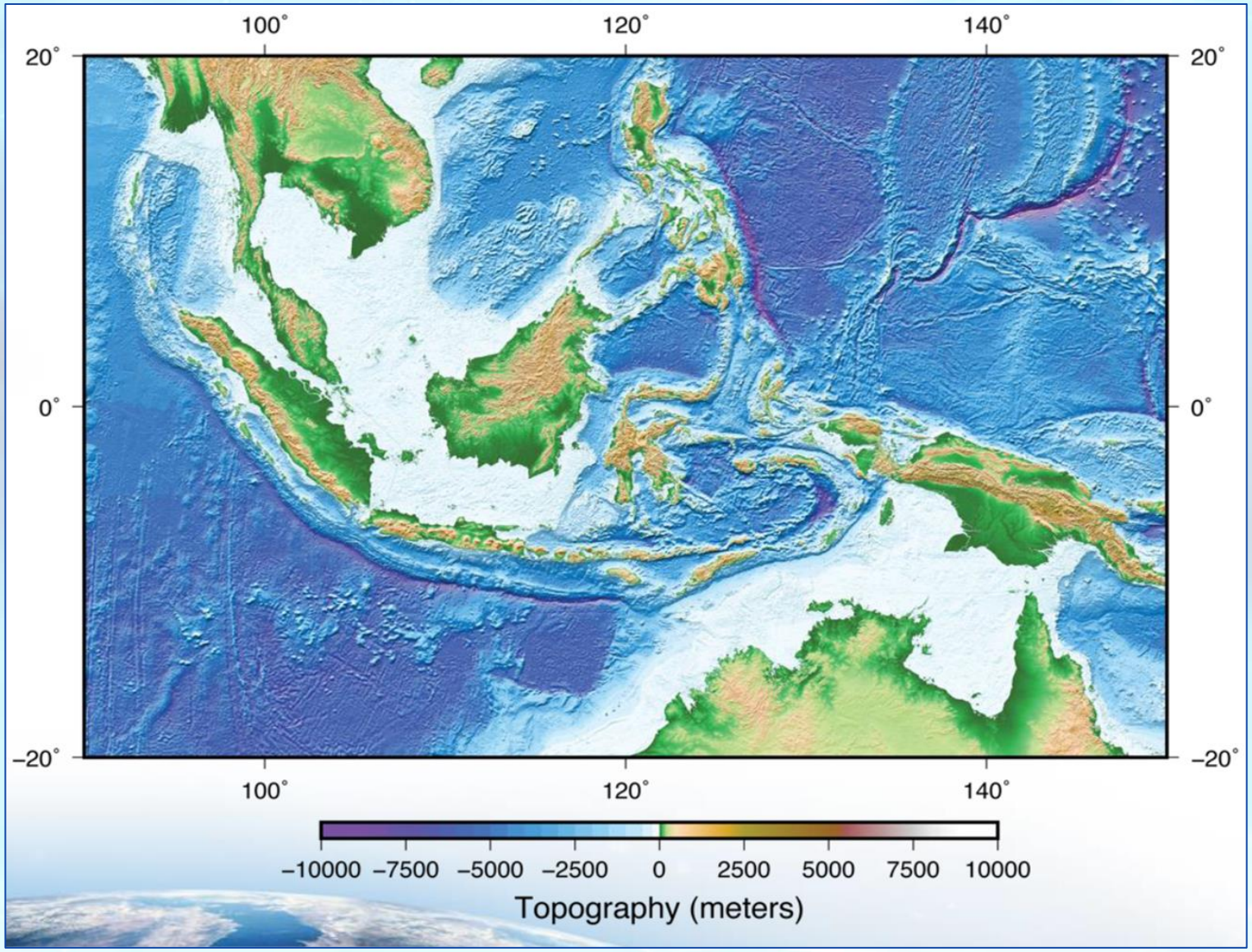
Management of Marine Resources



Management of national parks and marine conservation areas



National Digital Elevation Model (National DEM)



- Represent Integrated Land and Sea Bed Topography
- Land Topography (DEM):
  - Data Source: IfSAR Data, TerraSAR-X data, ALOS PALSAR
  - Resolution: 8.25 meter
- Sea Bed Topography (DEM):
  - Data Source: Bathymetric Survey Data from various institution (BIG, BRIN, BBSPGL, Ministry of Transportation, global bathymetric data
  - Resolution: 6 arc second (approx. 180 meter)

Why Do We Need Collaboration?

- Several government institutions are conducting bathymetric survey to support their own task and function:
  - **BIG:** production of Indonesian Base Maps
  - **Pushidrosal:** production of Nautical Chart
  - **BRIN:** research and development in marine area
  - **Ministry of Energy and Natural Resources:** study of marine geology and natural resources exploration.
  - **Ministry of Transportation:** management of navigational aid and safe for navigation
- Indonesia is an archipelagic country with 77% of the area consist of water
- None of the institution has complete bathymetric data for the whole country
- Collaboration of related institutions **is a must** to fulfill the needs of bathymetric data.
- in 2022, the Coordinating Ministry of Maritime and Investment has established a national team for organizing bathymetric data

COLLABORATION MECHANISM IN BATHYMETRY DATA COLLECTION

Bathymetric Data Collection

BADAN INFORMASI GEOSPASIAL

Bathymetric Data

Marine and Coastal Base Map Production

Bathymetric Data

Nautical Chart Production

BRIN BADAN RISET DAN INOVASI NASIONAL

Bathymetric Data

Research and Development

Bathymetric Data

Marine Geological Study

Bathymetric Data

Navigation Aid

Global Bathymetric Data

NODC, BODC, Data Altimetri, dsb)

Bathymetric Data Integration

National Bathymetric Data

Quality Assurance

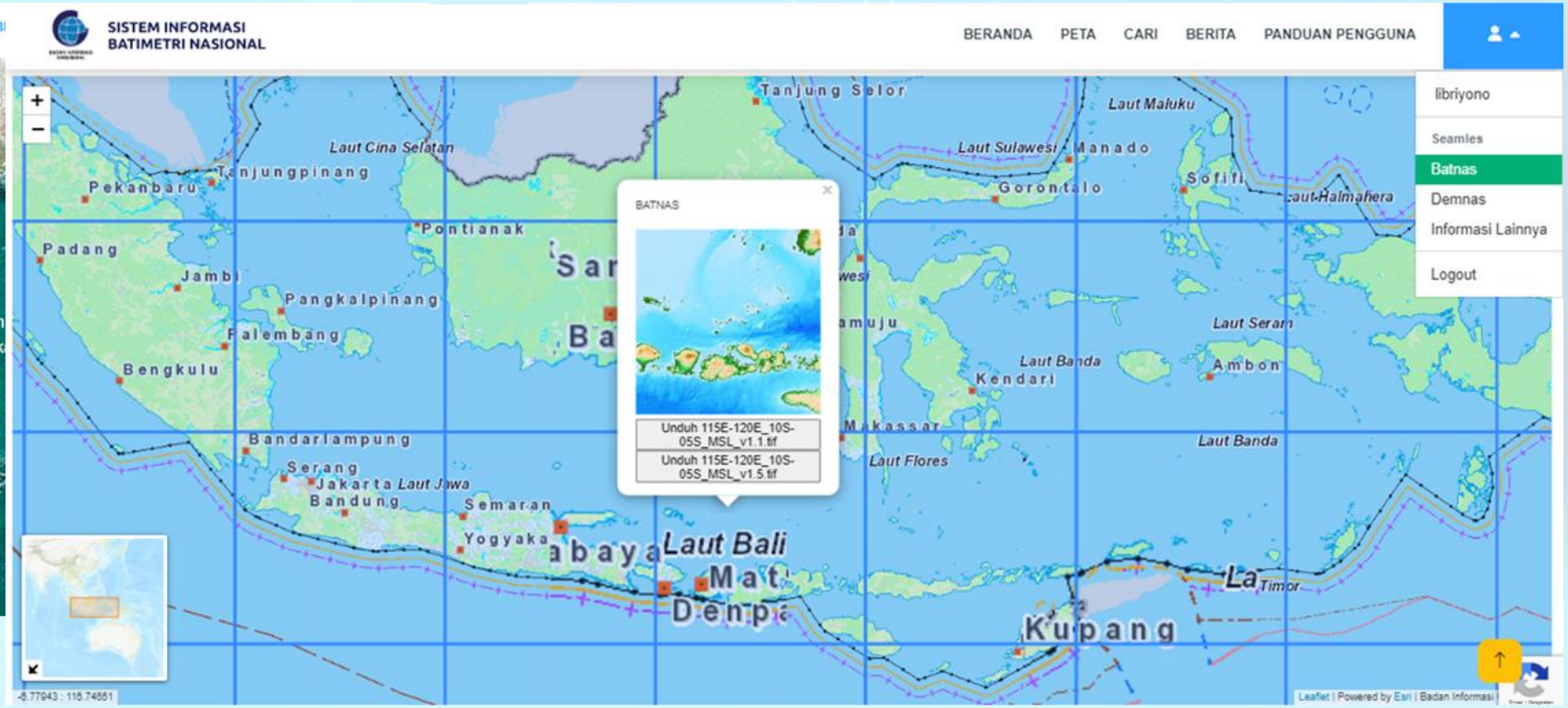
Low Resolution DEM

Dissemination through National Geospatial Information Network:
- Open to public
- accessible through *web services*

Bathymetric Data and High Resolution DEM

Dissemination through National Geospatial Information Network:
- Restricted access to related government institution
- Accessible through downloadable link and/or *web services*

SIBATNAS: Information System To Access National Bathymetric Data

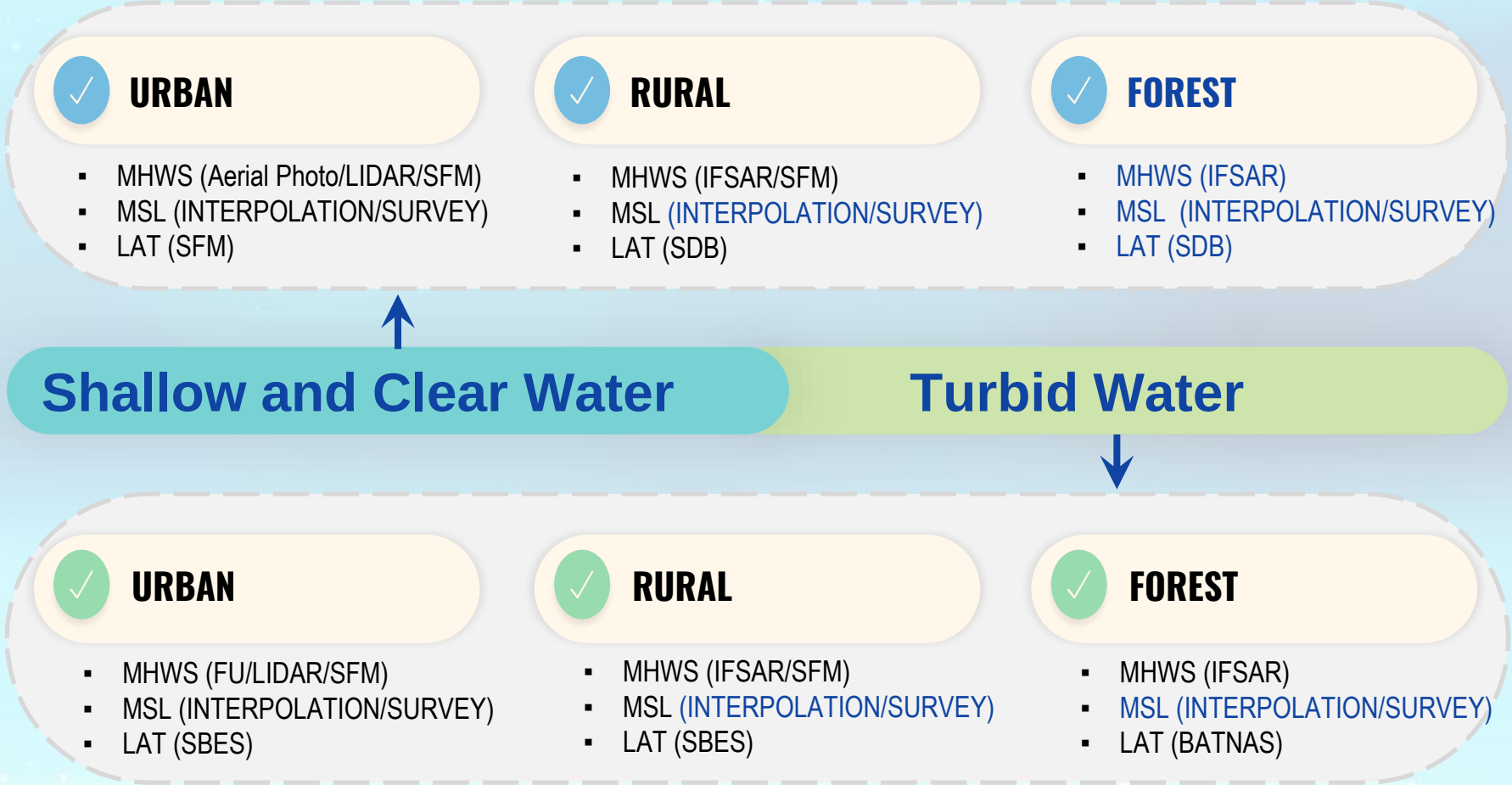


Indonesia National Bathymetry Information System (SIBATNAS) for collection, management, visualization and dissemination of marine geospatial information

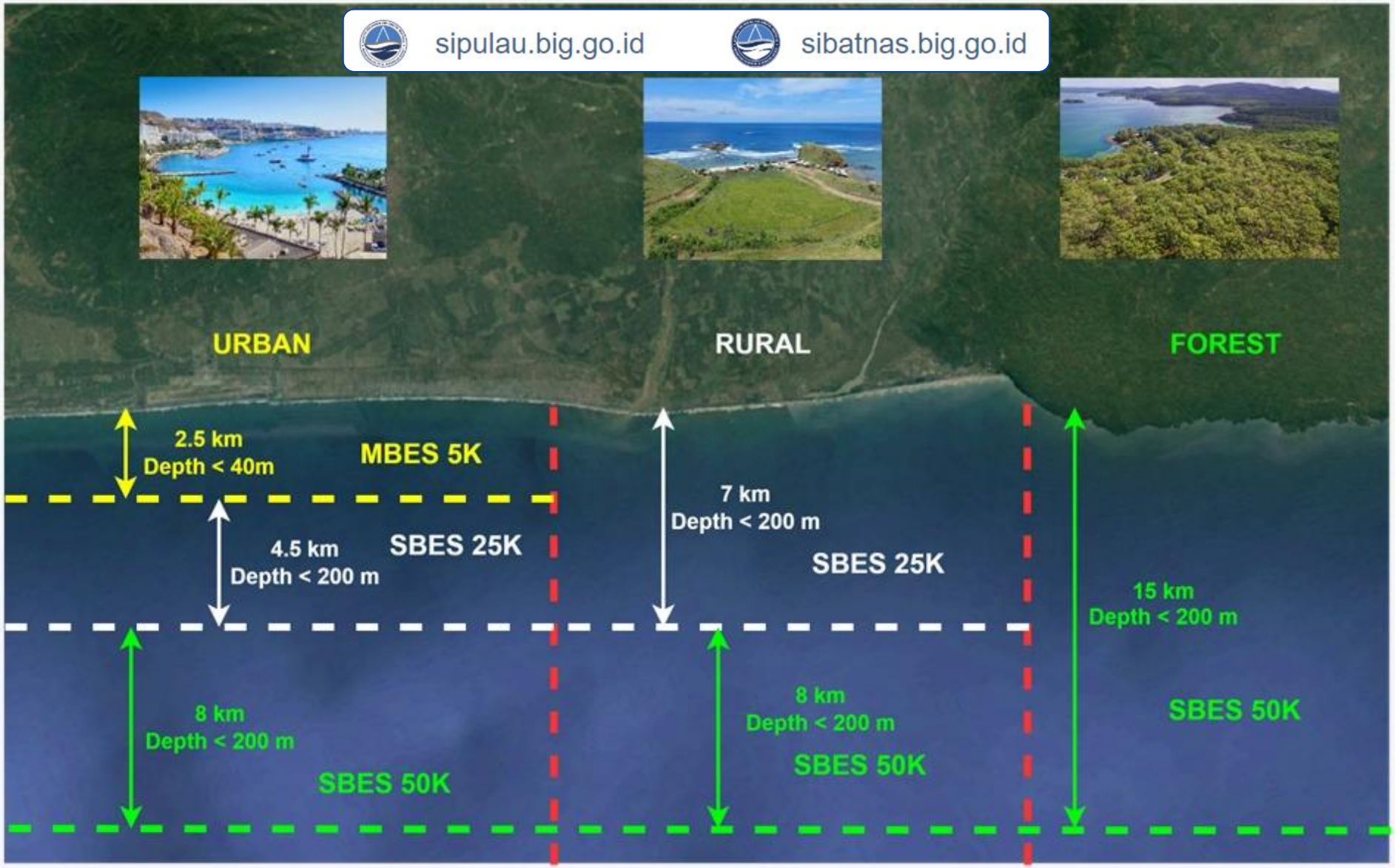
Combined Method for DEM Generation in Coastal and Marine Area

- Indonesian water can be categorized as follows:
  - Shallow water and deep water
  - clear water and turbid water
  - sea water in front of urban, rural, dan forest area

BIG implement combined method to collect data for Coastal DEM as well as coastline generation.



Priority of Bathymetric Survey In Water Front of Urban, Rural, And Forest Area For Base Map Production



Indonesian Base Map

Peta Rupabumi Indonesia (RBI)

Indonesian Base Maps provide geospatial information on land, sea and coastal areas in an integrated manner.
(PP 45/2021, UU 6/2023)

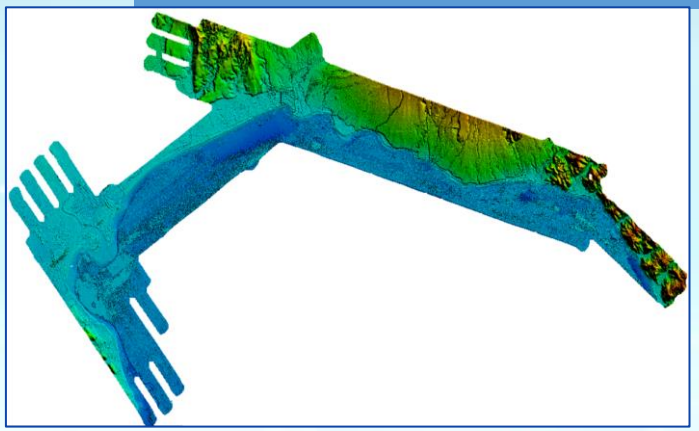
Content of Indonesian Base Maps:

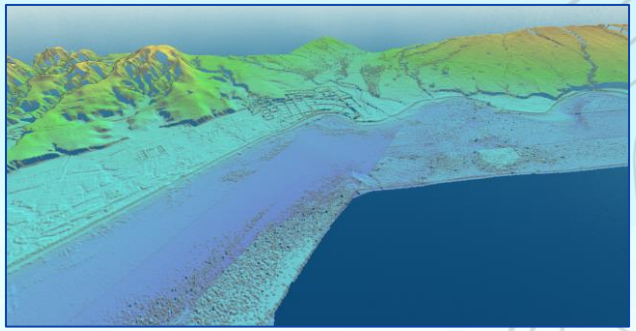
Coastline – Hypsography – Hydrography –Geographical Names – Boundaries – Transportation and Utilities – Building and Public Facilities – Land Cover

Peta Rupabumi Indonesia (RBI)

Indonesian Base Maps:

- covers **land area, coastal area, and marine area in an integrated manner**.
- **Coastline** is represented at high water level (MHWS), mean sea level (MSL), and lowest water level (LAT)
- **Geoid** is used as universal height reference system for both land and marine.
- **Systematic Scale** of 1:5.000; 1:25.000; 1:50.000; 1:250.000; and 1.000.000 throughout Indonesia region.



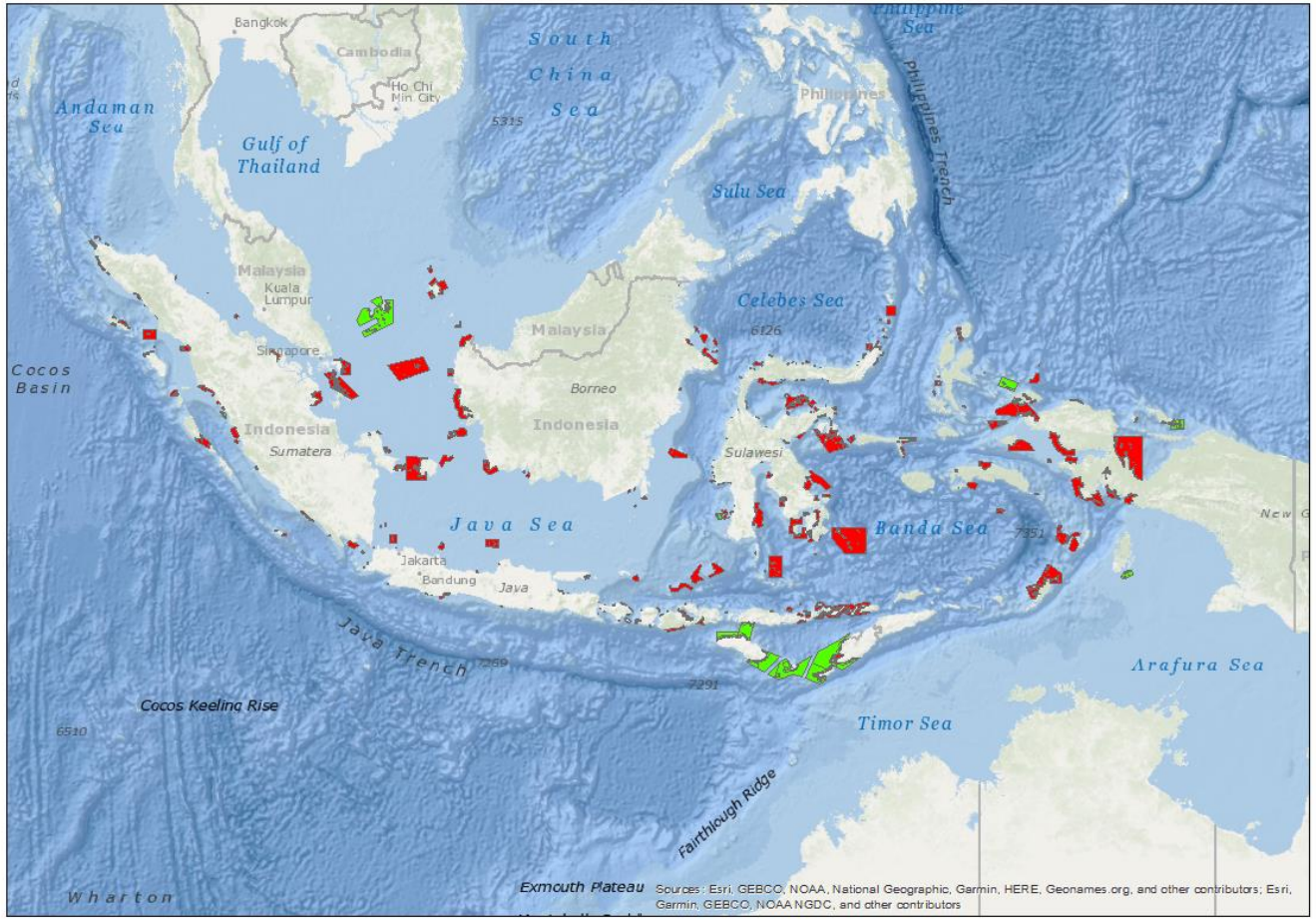


OCEAN ACCOUNTING

14 LIFE BELOW WATER

"Ocean Accounting for Sustainable Development.
(Global Ocean Account Partnership)

"Ocean Accounts are an integration of structured information which has consistency to the marine economy activity. Consists of Geospatial Data and Statistics for ocean and coastal indicators.



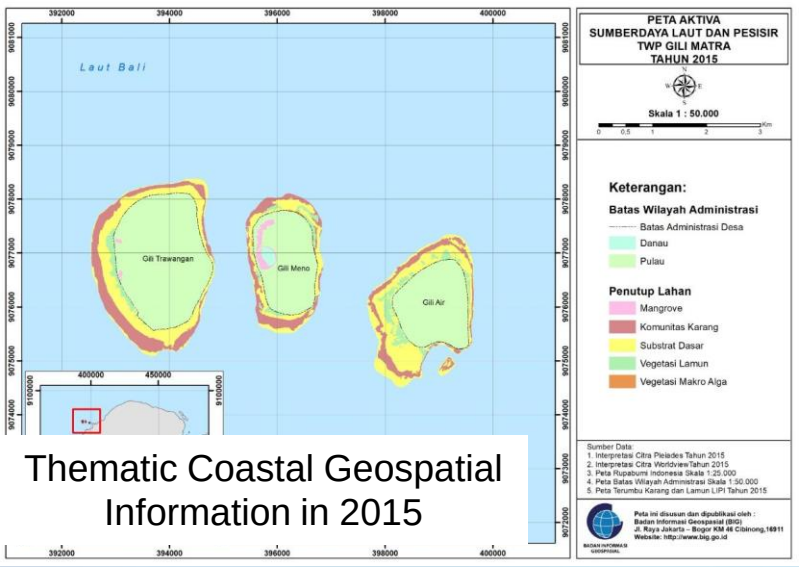
General Structures Ocean Accounts Framework:

1. **Ocean Assets** (Natural Capital)
2. **Flows to Economy** (supply and use of ocean services, including goods)
3. **Flows to Environment** (residuals including ecosystem impacts)
4. **The Ocean Economy** and the Economy
5. **Governance**
6. **Combined Presentation**
7. **National Wealth**

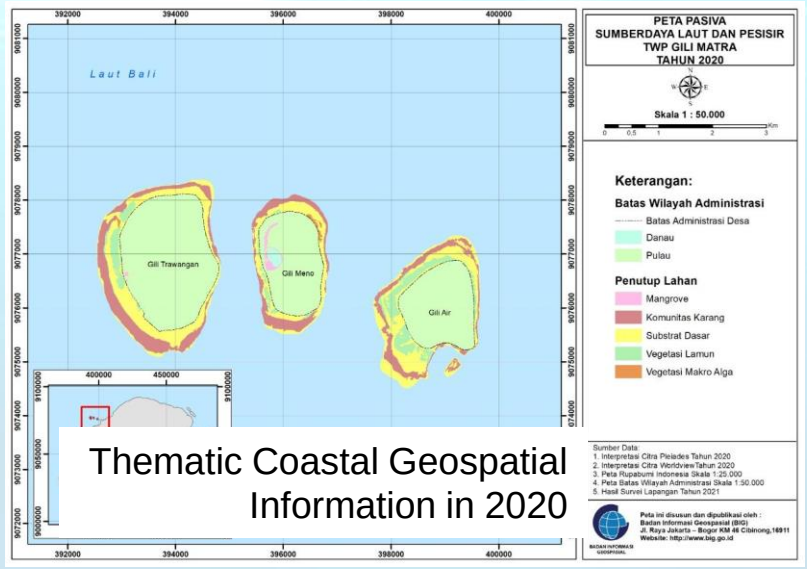
Inventory of Ocean Assets Indonesia 2021 - 2024
Estimation of Natural Coastal Resources' values in any circumstances for any marine productions
.

BIG is mandated to conduct bathymetric survey and provide base maps in 10 National Ocean Conservation Zones

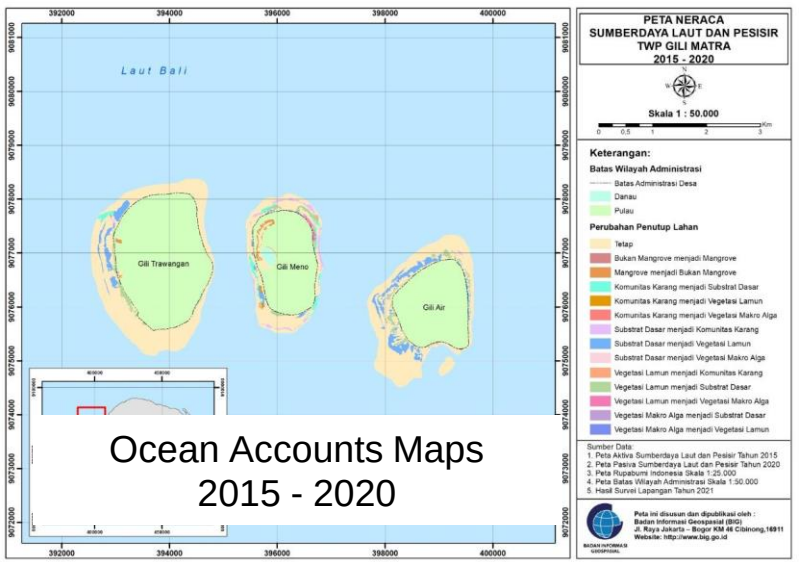
BENEFICIARIES OF OCEAN ACCOUNTS



Thematic Coastal Geospatial Information in 2015



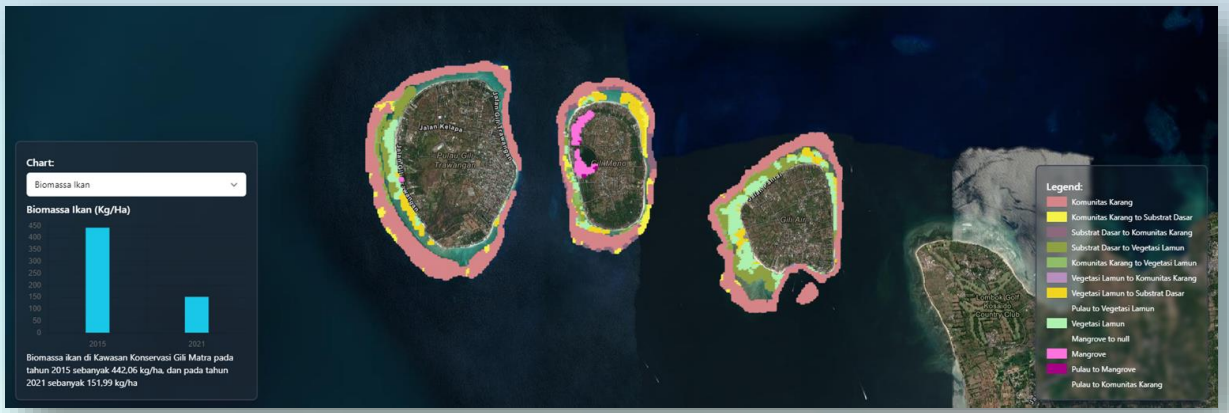
Thematic Coastal Geospatial Information in 2020

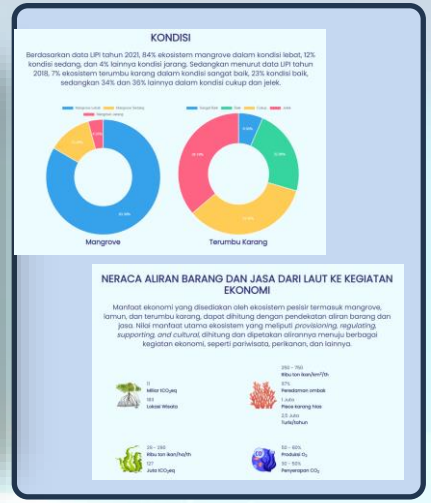


Ocean Accounts Maps 2015 - 2020

Benefits

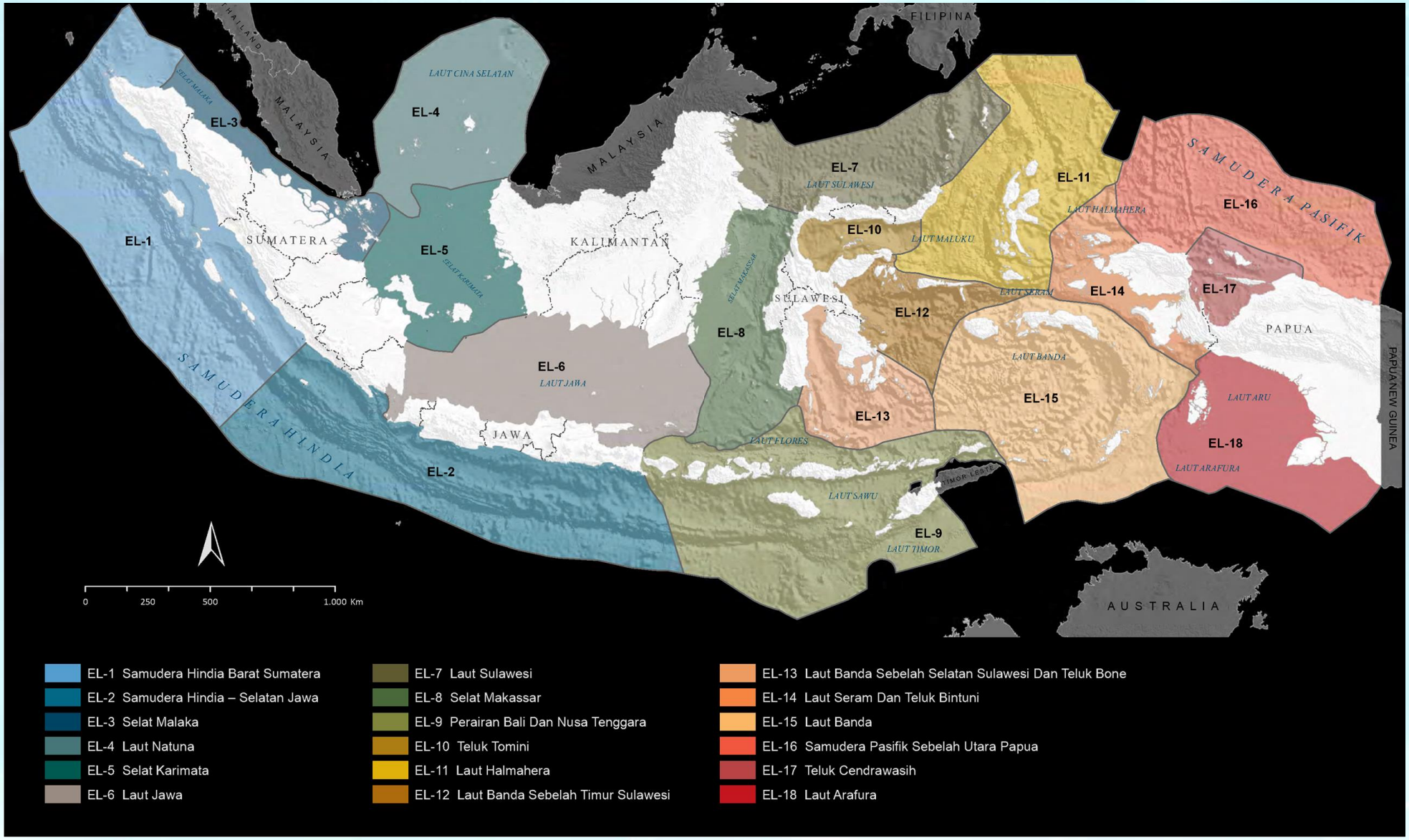
- Identifying the potential of available marine resources
- Identifying the changes in the area of mangrove land cover, coral reefs and seagrasses
- Basis for determining marine resource management policies
- An indicator of the balance of economic growth and marine sustainability
- Determining the location for monitoring and rehabilitation area
- Increase economic benefits from the marine and fisheries sector





INDONESIAN MARINE ECOREGION

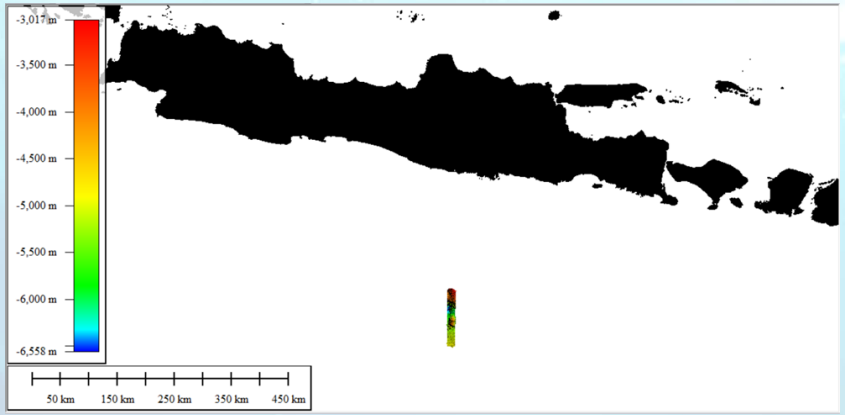
Marine Ecoregion consists of zonations with relatively homogeneous species compositions and distinct from each others (Spalding *et al.*, 2007)

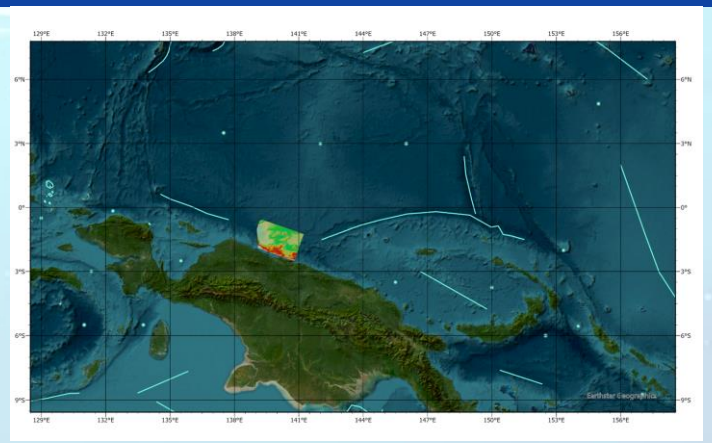


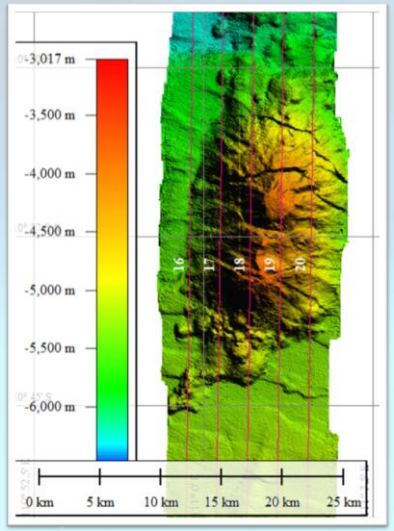
Ecoregion Drafting Parameters:

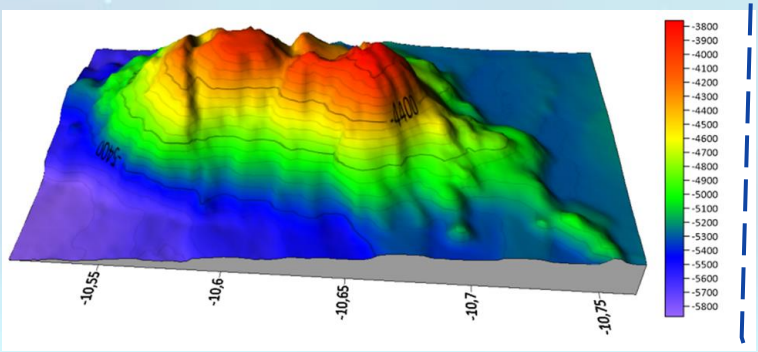
1. **Seabed Morphology**
   a) Geomorphology
   b) Bathymetry
2. **Oceanography**
   a) Ocean Current
   b) Tidal Wave
   c) Upwelling
   d) Temperature
   e) Salinity
   f) pH
   g) Chlorophyll
   h) Nutrients
3. **Biodiversity**
   a) Mangrove
   b) Seagrass
   c) Coral
   d) Fisheries
4. **Boundary**
   a) Country
   b) Global Marine Ecoregion

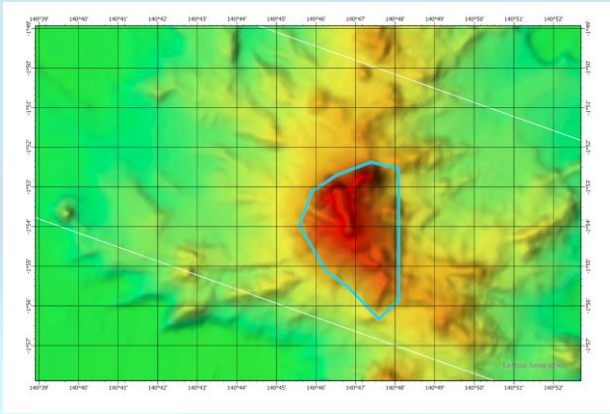
UNDERSEA FEATURES DISCOVERY BY BATHYMETRY SURVEY

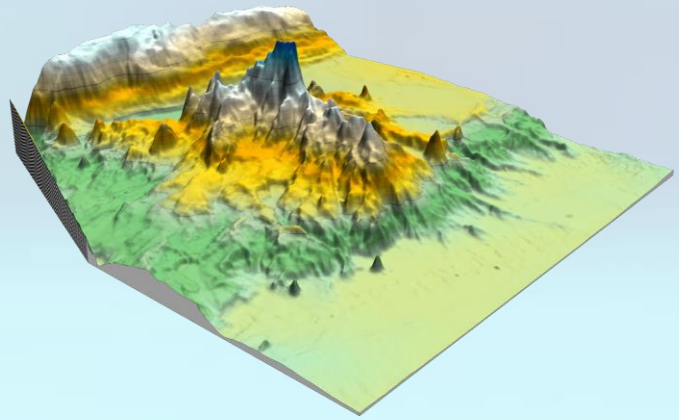












Jogo Jagad Seamount. Discovered at 2022 in south of Java
Total Relief: 1.400 m.
Maximum depth: 5.200 m.
Minimum depth: 3.800 m

Unnamed Seamount in Papua. Discovered at 2019
Total Relief: 1.200 m.
Maximum depth: 3.200 m.
Minimum depth: 2.000 m

Conclusion

- **Indonesia has strong vision and interest** on marine geospatial data and information.
- **The national bathymetric data and DEM** plays an important role as a basic geospatial information where any other thematic information can be overlaid and integrated for analysis.
- the needs of national bathymetric data can be fulfilled by **collaboration between institutions** who has task and function related to bathymetric data collection.
- **Integrating** marine geospatial information is crucial to maximizing the benefits.


Thank You!
Terima Kasih

CONTACT INFORMATION

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