

# Oceanic Domain Awareness- A Concept

Rear Admiral Dr. S Kulshrestha , retd



“He knows the course of the stars and can always orient himself. He knows the value of signs, both regular, accidental and abnormal, of good and bad weather. He distinguishes the regions of the ocean by the fish, by the color of the water and the nature of the bottom, by the birds, the mountains, and other indications ...”

The Mu'allim, 434 AD

# Oceanic Domain Awareness



# Maritime Domain Awareness

The oceans are complex mediums whose nature provides ample opportunity for an enemy to avoid detection—weather, sea states, and coastal land masses all present considerable challenges to modern sensors.

It is the asymmetric nature of terrorism that forms the core of Maritime Domain Awareness (MDA).

Maritime Domain Awareness is “the effective understanding of anything associated with the global maritime environment that could impact the security, safety, economy or environment of a country. This is accomplished through the integration of intelligence, surveillance, observation, and navigation systems into one common operating picture (COP) that is accessible throughout the Government.



**MDA's core process is the monitoring of vessels and the vessel's cargo, crews, and passengers to rapidly generate geo-locating information on vessels of interest.**

**MDA's core is applying the vessel tracking process to a layered defense model centered on the coastline of India,**

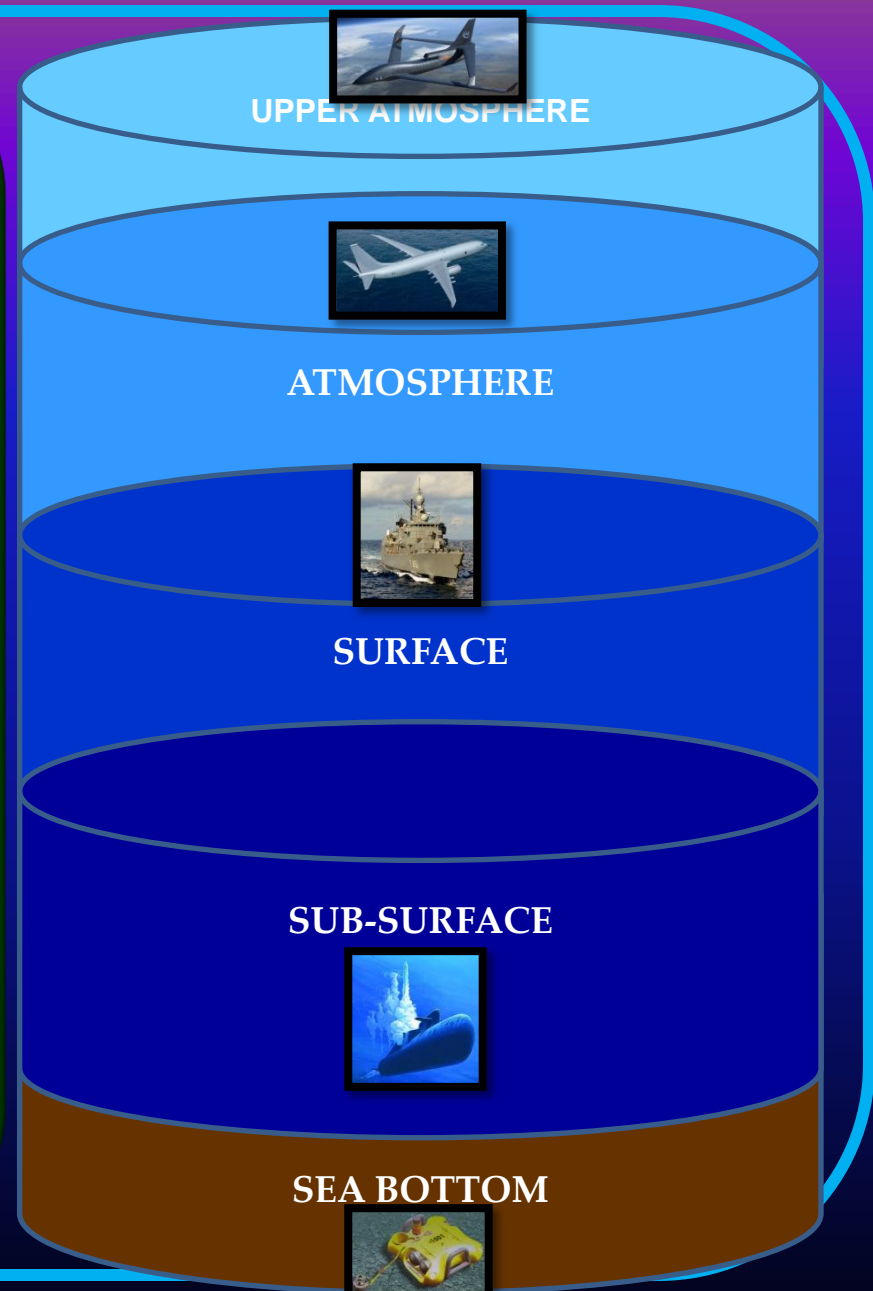
**For a comprehensive MDA picture, information needs to be fused, correlated, and analysed and for it to be relevant to national security it must be designed to operate cohesively at tactical, regional and strategic levels.**

**Strategic MDA requires a broad perspective and capabilities at the highest levels of analysis, intelligence, and policy.**

*Two areas of sensor technologies that have particular applicability to strategic MDA are a satellite based sensing capability and a net work of underwater surveillance sensors.*

**Some of the Indian MDA initiatives include; setting up of Multi Agency Centers (MAC) for intelligence inputs and reports; registration of fishing vessels by states; placing in orbit Indian Regional Navigation Seven Satellite System and satellite GSAT 7 ; setting up of a coast wide radar chain; raising Marine Police force, Marine Commandos Rapid Reaction Force and a Sagar Prahari Bal (SPB); setting up layered patrolling; putting in place The National Command Control Communication and Intelligence network (NC3IN) etc.**

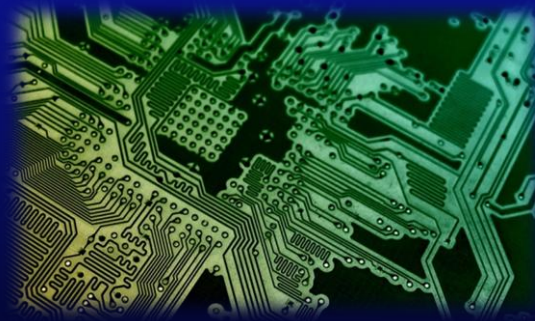
*In my opinion* Indian Navy would aspire to acquire formidable sea denial and sea control capabilities. The terms Sea watch/denial/ control are likely to expand and transform in to '*Oceanic space watch/denial/control*'. The term Oceanic space would embrace a cylindrical space in 3D+ dimensions; that is the sea surface, the atmospheric volume above, the outer space at least up to low earth orbiting satellite heights, the water volume up to the sea bed, the sea bed itself and also security of the deep sea mining assets in the EEZ



# Oceanic Domain Awareness

The premise implies that a broader oceanic horizon inclusive of not only extensive and broader spatial operating arena, but also much wider and broader foray in to the verticals below the surface to the sea bed and above up to periphery of the atmosphere.

*It is imperative that holistic perspectives into the information consciousness arena include the oceanic domain awareness as well as it's connect with India's security and MDA.*





## Oceanic Domain Awareness

- Scientific study of oceans originated in the U.S.
- The primary impetus was the emergence of submarine warfare
- Far reaching progress occurred due to technological advances in Sensors, Submersibles, and Sea bed research,





# Current Status

-Scientists have now commenced a long term exploration of the chronological variations in ocean systems. This is facilitated by:

- Availability of new sensors which can report upon chemical, biological and physical characteristics
- Advances in computers and software that has enabled storing, retrieving and manipulating large volumes of sensor data
- Advances in telecommunications through undersea cables and satellites

*Technologies (e.g., robust sensors and infrastructure, autonomous vehicles) need to be developed to enhance data collection in all weather conditions to support high-spatial resolution and near-real-time forecasting*

-This expansion will require advances in sensor and technology development, expanding real-time data collection on environmental variables by incorporating observational capabilities of crafts of opportunity and enhancing automated and autonomous bottom-mapping capabilities .

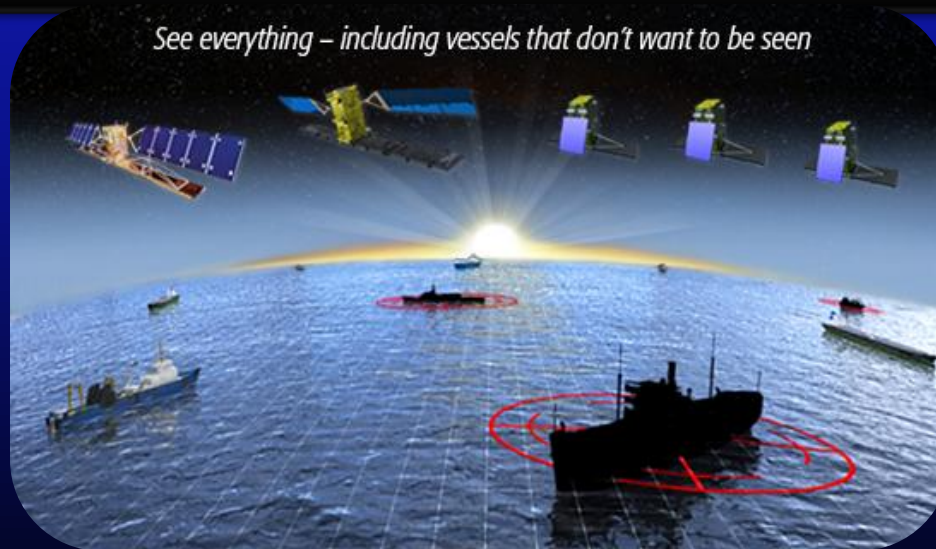
-Data collected by the observing systems must be accessible through a comprehensive national data network. This data network should be able to link with other databases,

-The coast and open ocean are critical domains for the security of a nation with sea as boundaries. National-security operations in the ocean require continuous, near-real-time monitoring of environmental conditions.

*These capabilities, will allow future forces to conduct joint and combined operations in near shore and deep-ocean operating environments, anywhere and at anytime.*

**MDA focuses upon the maritime security environment specific to naval operations; the ODA focuses upon the overarching oceanic environment.** Both are technology intensive and require sophisticated sensors and computational capabilities.

**MDA has tactical, regional and strategic components whereas the ODA is strategic knowledge based architecture.** Both require elaborate data and information fusing interface with myriad of interconnected agencies. **The MDA primarily needing vast inputs from commercial, intelligence and security agencies and the ODA from advanced research, academic and scientific communities.**





There is an imperative need for policy level intervention in respect of:-

**-Integration of Oceanic Domain Awareness with MDA.**

It is only when these aspects are embedded in maritime strategy would India have a formidable Oceanic force.





Let us not look back in anger, or forward in fear but around us in awareness.

James Thruber

The satellite named Rukmani is carrying communication transponders in UHF, S, C and Ku bands that will be switched on gradually. The four transponders will improve the maritime communications among the Indian Navy's warships, which are increasingly performing longer patrol duties protecting the sea lines of communications [SLOC's].

The satellite is essentially a geo-stationary communication satellite possessing real-time input capability to the units at sea and on shore. With the help of the shore-based operational centers, "It will keep an eye over both Arabian Sea and Bay of Bengal. It will also cover an area spread from Persian Gulf to Malacca Strait and will thus cover an area equivalent to almost 70 percent of the IOR,"