



Central Weather Bureau

中央氣象局海象測報中心

Marine Meteorology Center

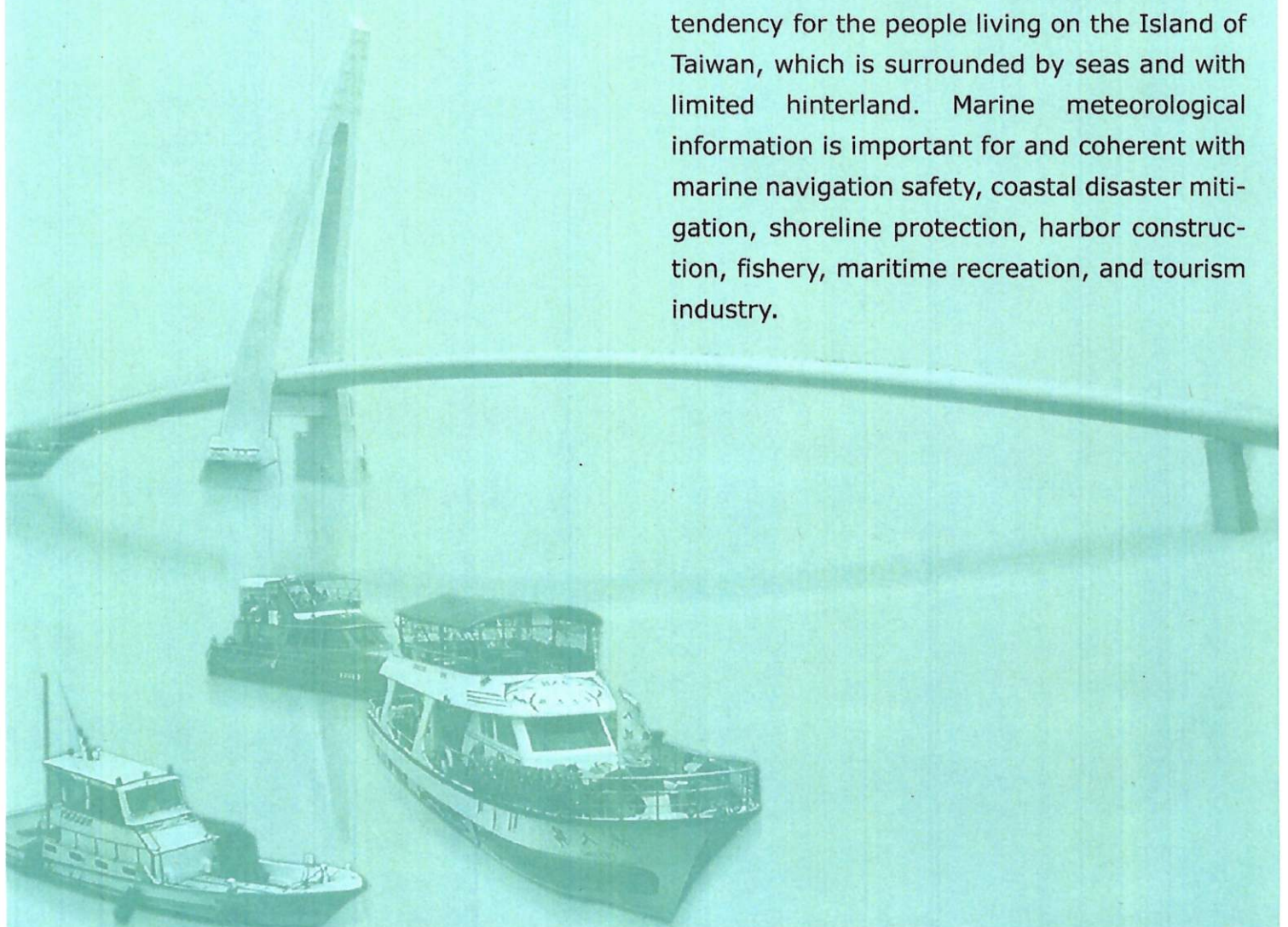


中央氣象局海象測報中心於民國82年7月1日成立，職司全國海象觀測與預報業務，以及負責蒐集、整合國內外海象資訊，提供大眾日益殷切的海象資訊服務。

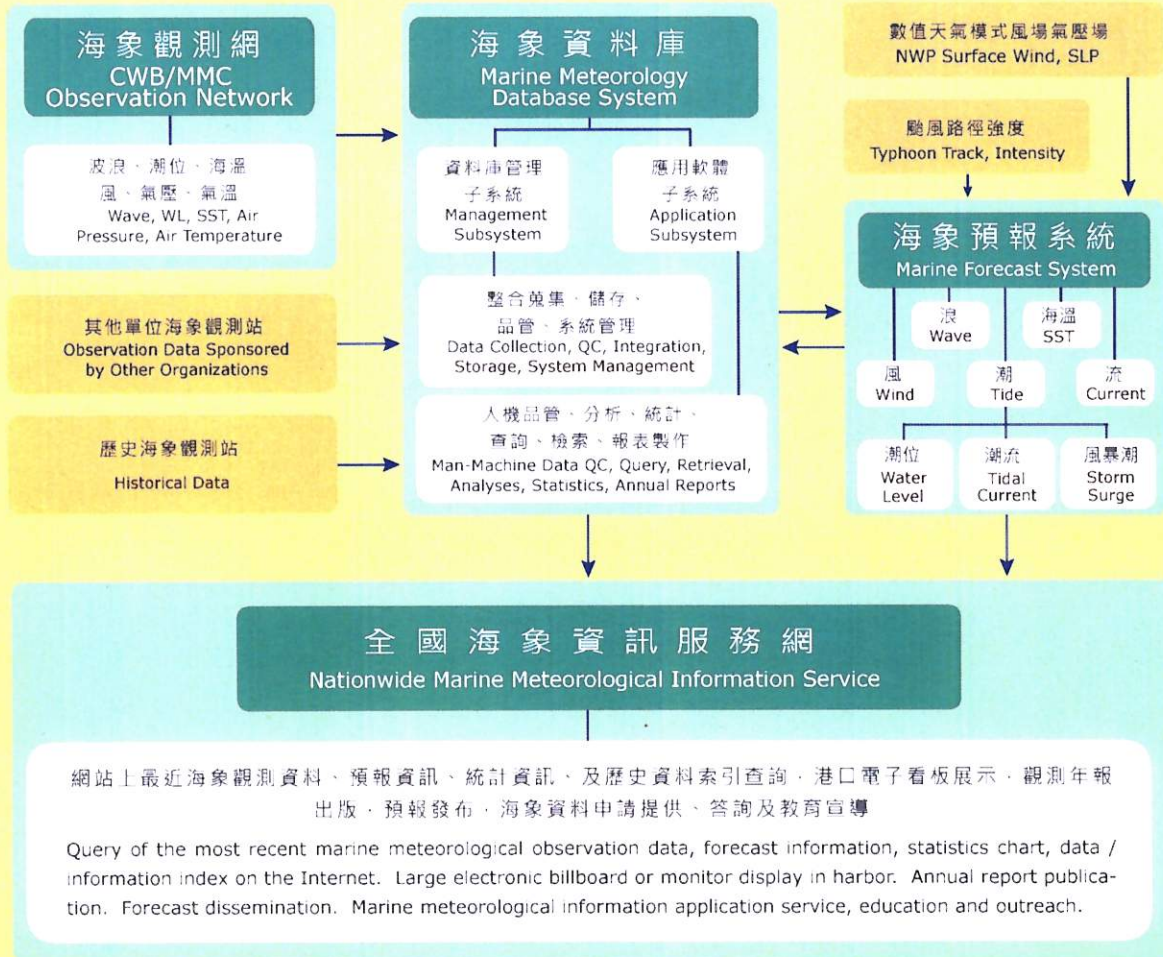
海象是指潮汐、波浪及其他存在於大氣與海洋交界面之自然現象，包括波浪、潮位、海溫、海流及海氣交互作用等。臺灣四面環海，陸地面積狹小，往海洋拓展是必然的趨勢，而海象資訊對於海上航行安全、海洋災害防治、海岸保護、港灣建設、海洋漁業、遊憩觀光產業、海洋資源開發、國土規劃及其他與海洋有關行業均息息相關。

The Marine Meteorology Center (hereafter MMC) of the Central Weather Bureau was established on July 1, 1993. The MMC has responsibility for conducting marine meteorological observation and forecasting for the nation as well as integrating domestic and international marine information. MMC also provides marine meteorological information services to the public to meet their needs, which are increasingly tremendous.

The scope of marine meteorology includes wind waves, tides, sea level variations, sea surface temperatures, coastal ocean currents, and air-sea interactions. Ocean exploration is a tendency for the people living on the Island of Taiwan, which is surrounded by seas and with limited hinterland. Marine meteorological information is important for and coherent with marine navigation safety, coastal disaster mitigation, shoreline protection, harbor construction, fishery, maritime recreation, and tourism industry.



海象測報作業流程圖
Flowchart of marine meteorology service



海象觀測

Marine Meteorological Observation

建立及整合海象觀測網，進行波浪、潮位、海流、海溫及海氣交互作用相關觀測，以掌握臺灣附近海域即時海象。中央氣象局海象測報中心目前已完成潮位及近海資料浮標觀測網之基礎建設，並發展岸基微波及高頻雷達測波流技術，近年更積極擴展海象觀測網，包含建置東沙島、臺東外洋資料浮標站及東吉島海流波浪站，觀測資料透過網路或衛星即時傳回本局並公布於本局網站。



▲ 龍洞潮位站 Longdong tide station



▲ 蘭嶼潮位站 Lanyu tide station



▲ 潮位樁 Pile station



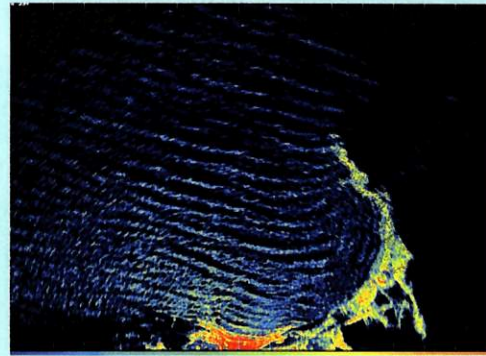
▲ 浮球式波浪儀 Waverider



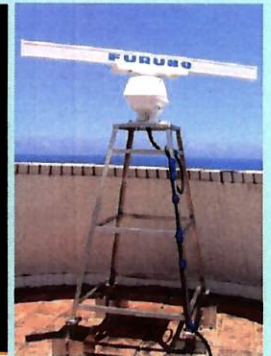
▲ 潮位站 Tide station



▲ 船舶自動辨識系統
Automatic Identification System



▲ 測波雷達回波圖
Wave radar image



▲ 測波雷達
Wave observation radar

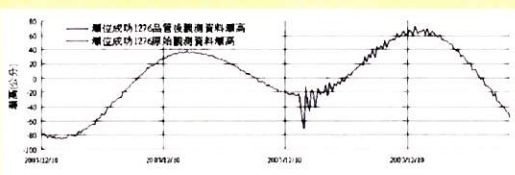
To measure and monitor near real-time coastal waves and currents, sea levels, and temperatures of the waters in the vicinity of the Island of Taiwan, the MMC has implemented an integrated observation system which consists of sea level measurement and coastal data buoy networks. Furthermore, the MMC continues to make efforts in developing land-based microwave and HF radar systems for waves and currents remote sensing, and enhancing marine meteorological observation network, which includes new deployment of Pratas and Taitung deep water data buoys and Dongjidao AWCP station.



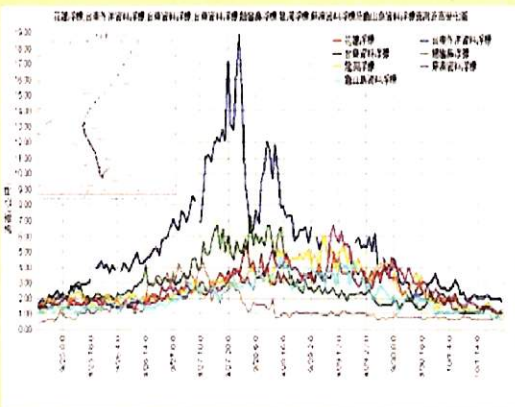
▲ 海氣象資料浮標 Data buoy



▲ 颱風暴潮圖 Storm surge chart



▲ 海嘯紀錄 Tsunami record



▲ 波高變化圖 Wave variation chart



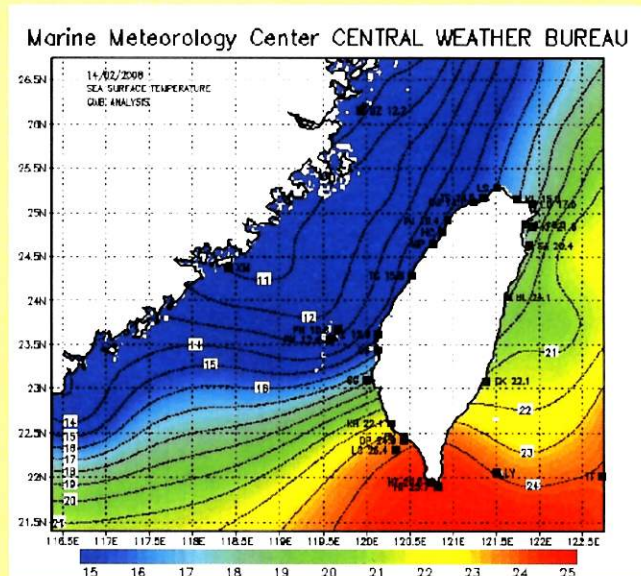
▲ 海象觀測網 Marine meteorology observation network

海象預報

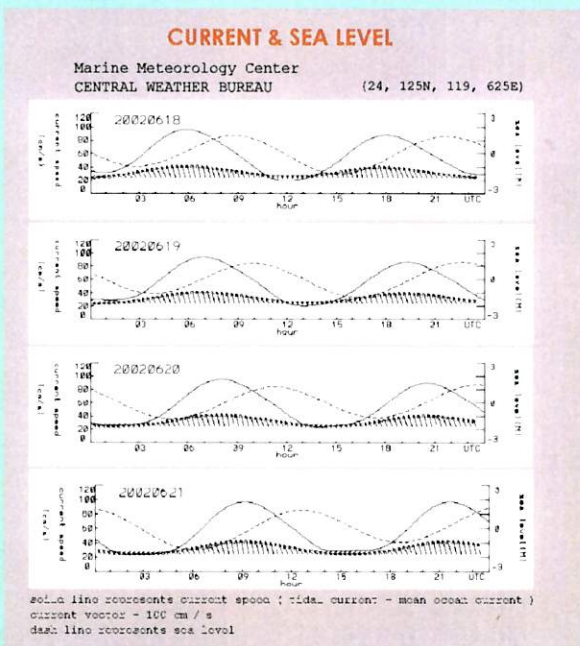
Marine Meteorological Forecast

發展海象預報作業系統，發布外洋、近海及沿岸之波、潮、流、水溫等各種海象預報資訊，提供近海觀光遊憩、漁業發展、海上航行安全、防災救難等所需之資訊。中央氣象局海象測報中心已具備多尺度波浪及潮位預報作業基礎，包括CWB/NWW3波浪模式、CWB/SWAN近海波浪模式、暴潮模式、海溫分析模式，又積極研發近海波浪預報技術、多尺度海流模式、海流預報及波浪系集預報技術等，及精進多尺度暴潮模式。

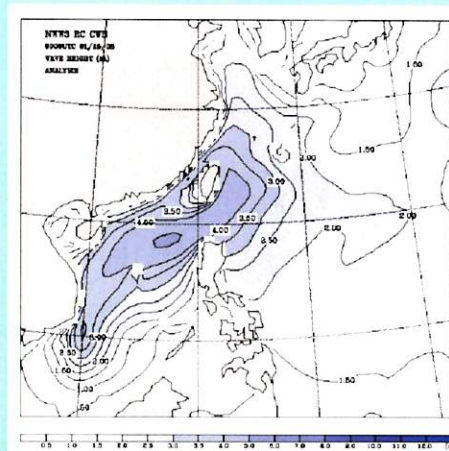
To develop marine prediction systems and to provide various marine information such as waves and currents, sea levels, sea temperature etc., at open ocean, near shore, and coastal areas for uses of marine activities and search and rescue efforts, the MMC has established infrastructure for multi-scale wave and sea level prediction, including CWB/NWW3 wave model, CWB/SWAN coastal wave model, and sea surface temperature analysis scheme. In addition, the MMC is currently developing coastal wave prediction techniques, multi-scale ocean current models, ocean current forecasting and wave ensemble techniques, as well as refining multi-scale surge models.



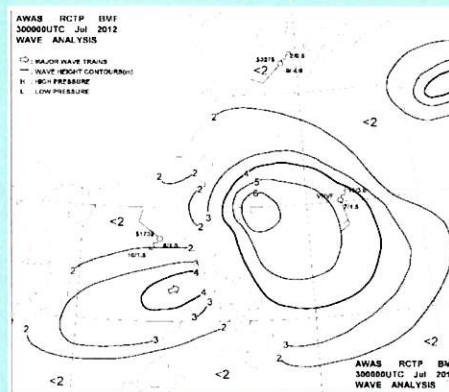
▲ 海水表面溫度分析 SST analysis chart for the Taiwan area



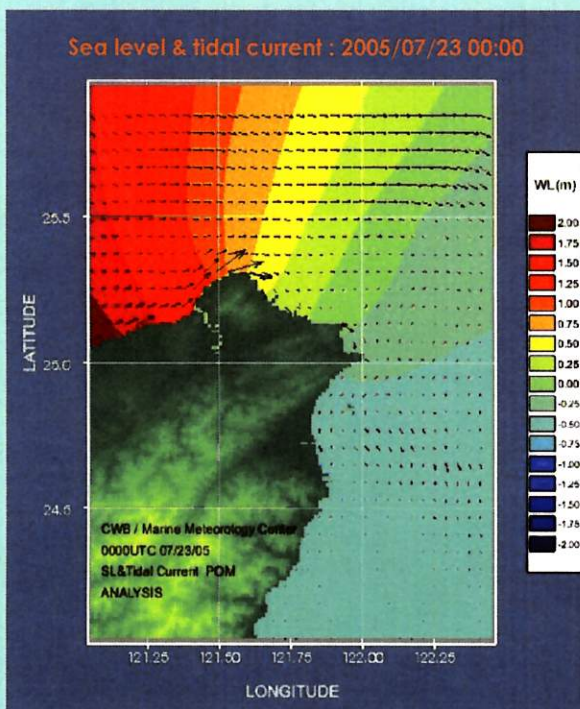
▲ 每日海流及海水面變化圖 Current and sea level chart



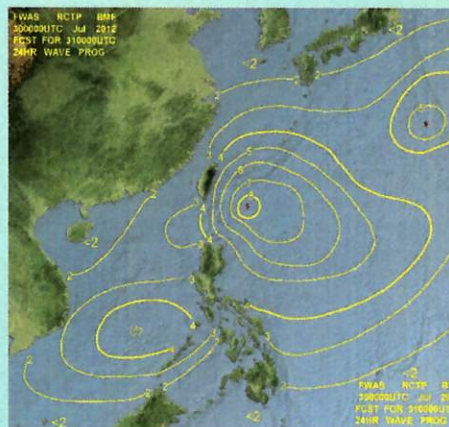
▲ CWB/NWW3 波浪模式圖
CWB/NWW3 Wave model chart



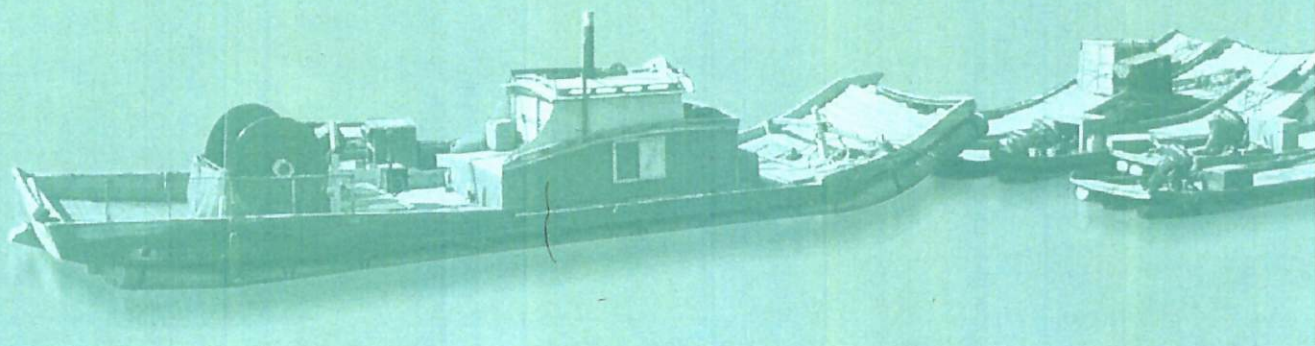
▲ 波浪分析圖 Wave analysis chart



▲ 潮汐預報圖 Tidal prediction chart



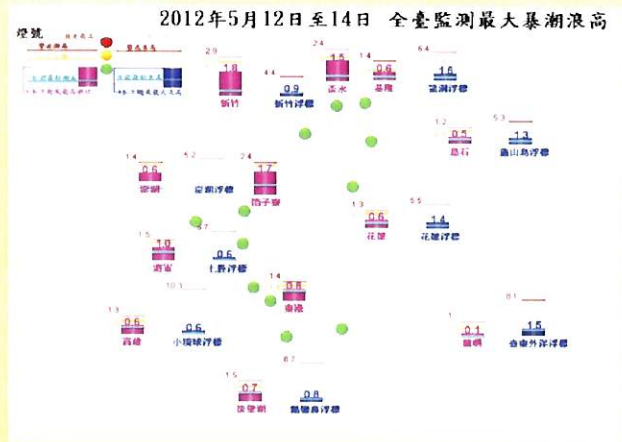
▲ 波浪預報圖 Wave forecast chart



海象資料庫

Marine Meteorology Database

建置全國海象資料庫與提供全國海象資訊服務，蒐集、統計、分析各種海象資料，開發海象資訊產品，利用各種傳輸管道，提供便捷的海象資訊服務。中央氣象局海象測報中心已具備全國海象資料庫系統及全國海象資訊服務網際網站基本建設，將持續蒐集國內外海象觀測資料，開發海象資料品質管制處理技術，訂定各式海象資料格式以能有效管理、保存及提供外界查詢，開發資料庫應用軟體及建立整合性即時海象資訊網站。

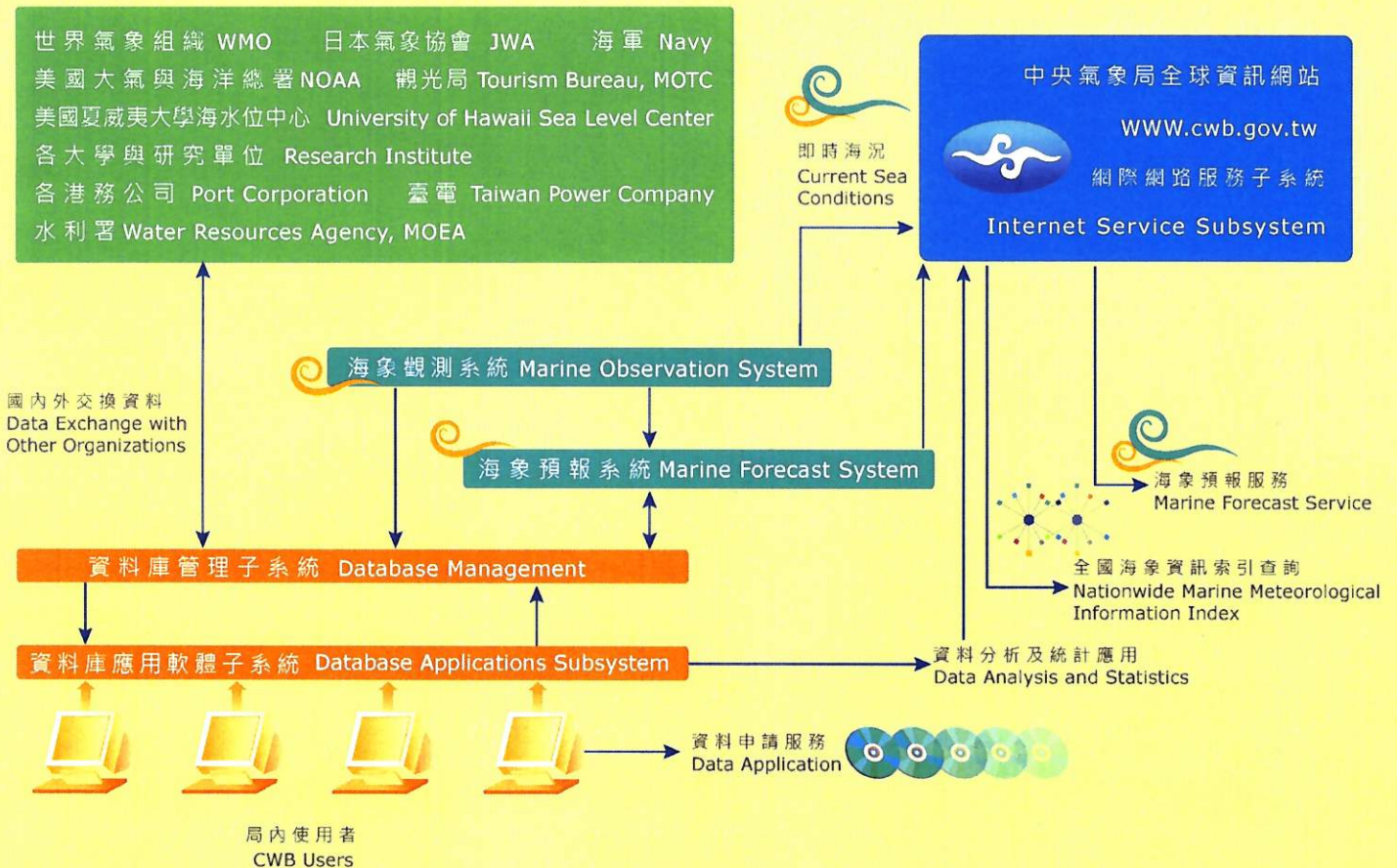


▲ 颱風暴潮浪高監控
Storm surge and wave monitoring

The MMC has set up a nationwide marine meteorology database to provide marine meteorological information services to the public in a timely and useful manner, through collecting, compiling and analyzing varied marine data, developing marine products, and utilizing various distribution methods. The marine meteorological information website has also been created. And the MMC will continuously collect both domestic and international marine data, advance data quality control method, stipulate various data forms and tables for effective management, storage, and query, develop database application software, and enhance the integrated, real-time marine meteorological information website for public access.

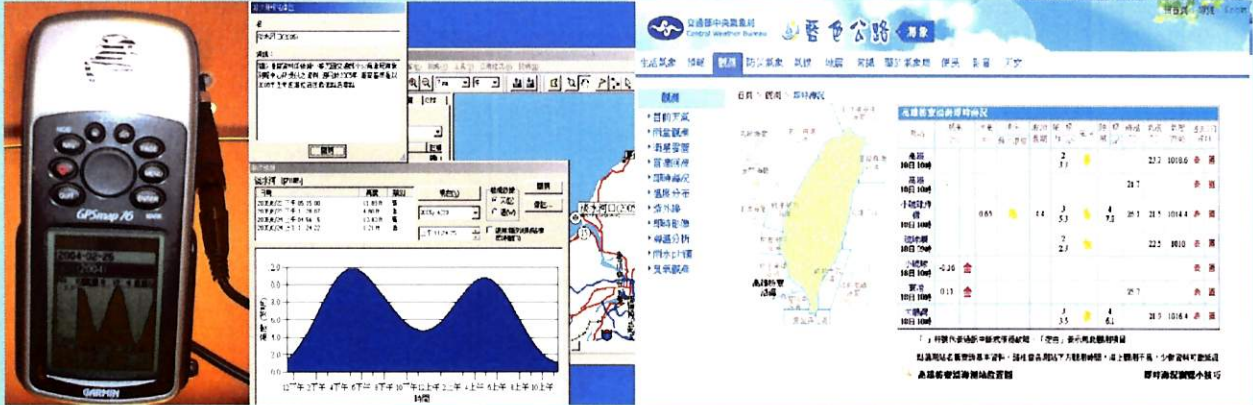
海象資料庫服務架構

The structure of marine meteorology database service



全國海象資訊服務

Nationwide Marine Meteorological Information Service



▲ 臺灣各地潮汐預報加值服務應用於海上GPS產品
The value added service of Taiwan tidal prediction on the marine GPS receiver

▲ 以網頁方式提供包含風向/風速、波浪、潮汐、氣溫、水溫、測站氣壓等即時海況
Provide the latest marine meteorological information on the internet

- 建置全國海象資訊服務網站，可查詢即時及近48小時近海海象現況資料、每日海表溫分析、海象預報模式動態預測圖、海象統計資料圖表、海象資料索引及1個月鄉鎮潮汐預報等。
- 建置藍色公路海象資訊系統，提升航行及遊憩娛樂安全。
- 訂定海象資料觀測及統計規範，定期出版各種海象觀測資料統計年報。
- 發布每年臺灣地區潮汐表。
- 海象資料申請服務。
- 海象資訊答詢及教育宣導。

- Promote public services about nationwide marine meteorological information of the internet. The services include providing the most recent 48-hour near shore sea state information, daily sea surface temperature analysis, marine model prediction animation, marine statistics chart, marine data/information index, and 30-day inshore tidal forecasts by township, etc.
- Establish the blue highway sea state forecast system to improve navigation and along-shore recreation safety.
- Stipulate standards for marine meteorology observation and statistics, and periodically publish various annual report.
- Release yearly tide table of Taiwan coast.
- Service for marine meteorological information application.
- Service for marine meteorological information inquiry, education and outreach.



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