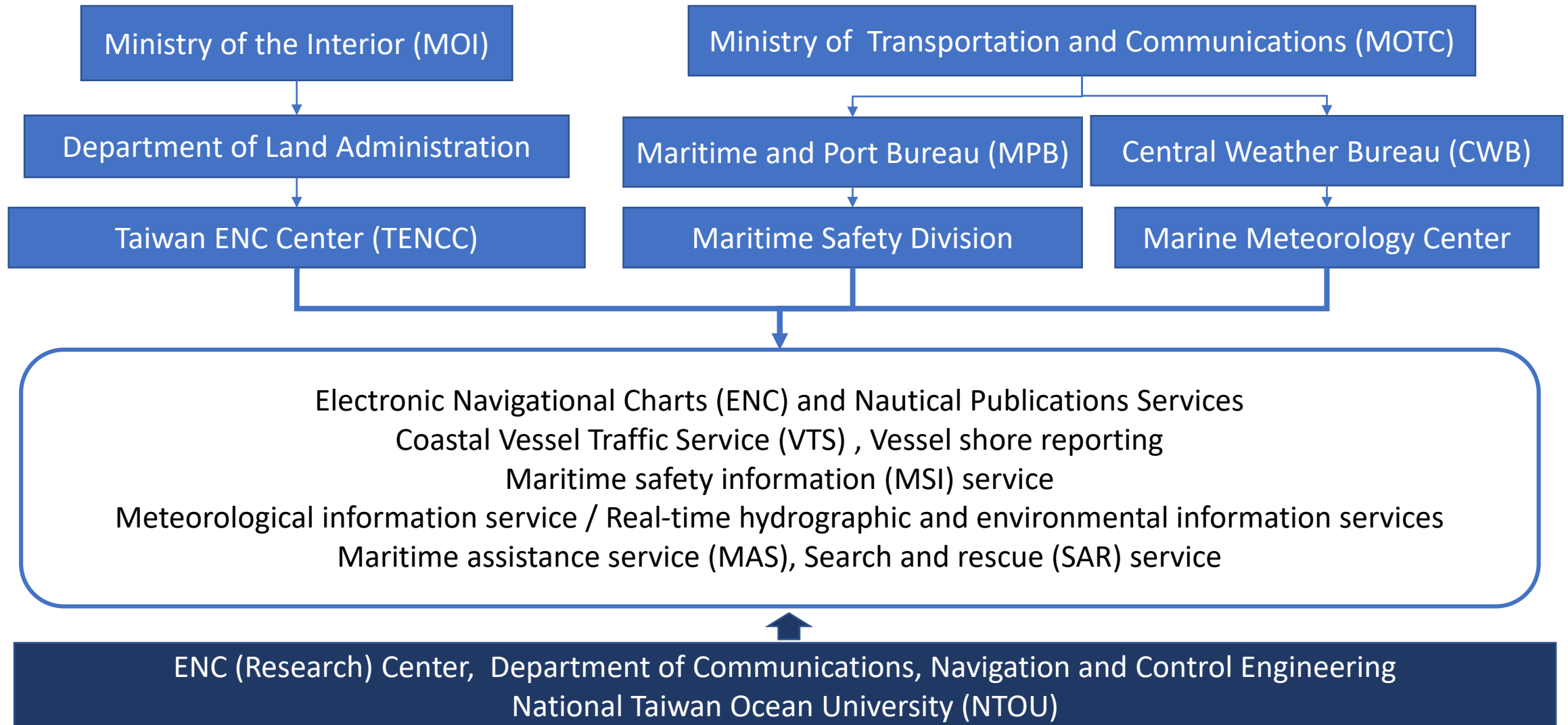




Taiwan ENC Center(TECNCC), Ministry of the Interior(MOI)
Maritime and Port Bureau (MPB) and Central Weather Bureau (CWB),
Ministry of Transportation and Communications (MOTC)

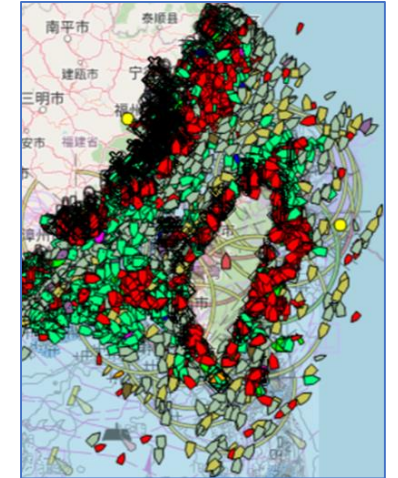
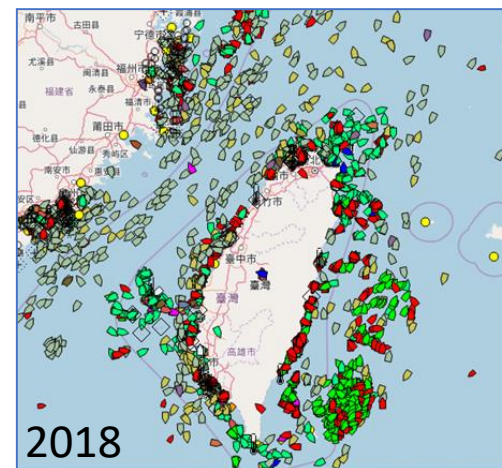
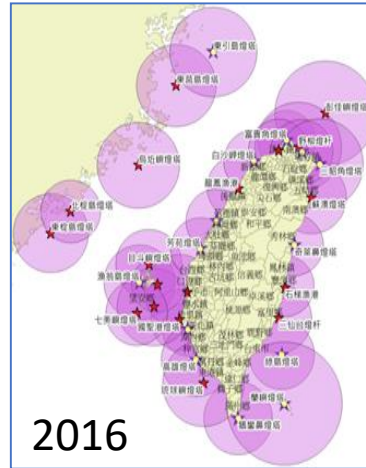
presented by
Shwu-Jing CHANG @ National Taiwan Ocean University (NTOU)

Administrations and Related Maritime Services

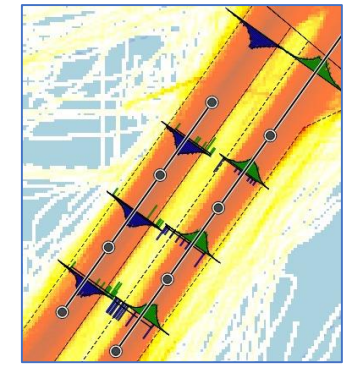
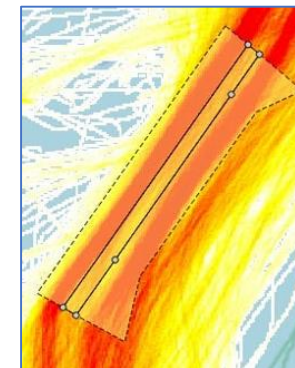
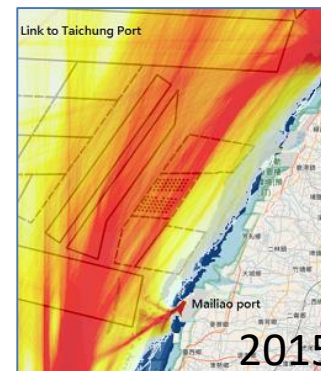


Coastal AIS Network (MPB)

- 33+ shore stations (14 BS, 19 AtoN) + receivers + Sat-AIS + ENC WMS
 - Vessel monitoring
 - Safety messages
 - V-AIS AtoNs
 - Risk assessment
 - Accident investigation
- data sharing with
 - Fisheries Agency
 - Coast Guard Administration
 - Environmental Protection Administration
 - Taiwan International Ports
 - Chunghwa Telecom (cable protection)
 - MOI (chart adequacy assessment)
 - CWB (ship weather observation reports)



Changhua Wind Farm Channel TSS



Weather Application-Specific AIS network (CWB)

FI	Message Name	Data Source
31	Meteorological and hydrographic data	Buoys(wind, wave and current..)
26	Environmental	Tidal(observation and prediction)
21	Weather observation report from ship	Shipboard weather instrument (automatic and manual entry)

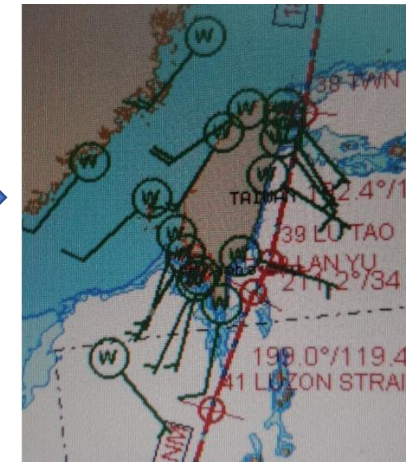


Met/Hydro Info. Service

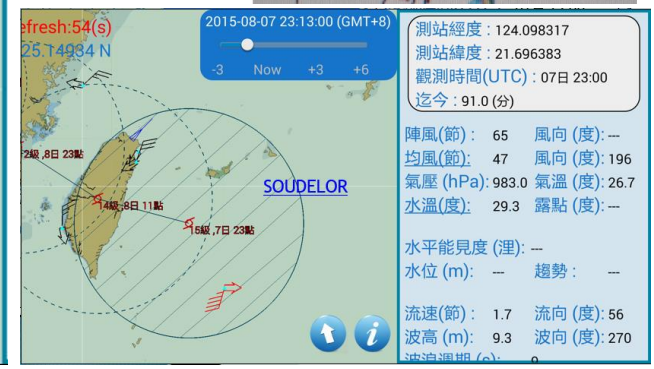
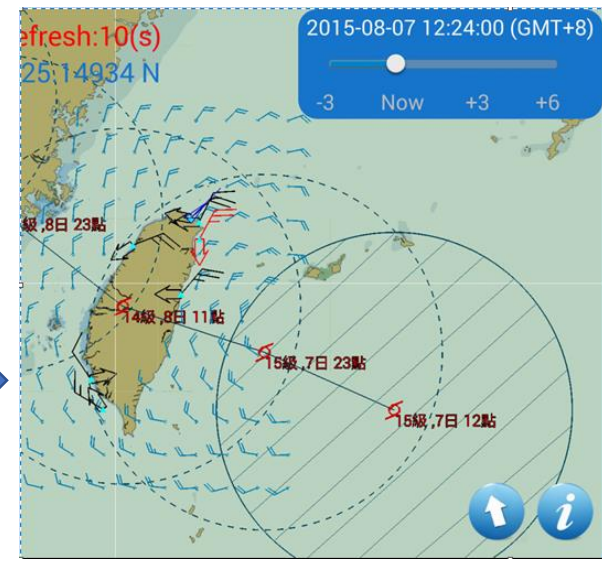


- Shore to ship
 - Data source → central control → a network of 8 shore stations
 - International ASM: sensor data (data buoys & tidal stations) & forecast
- Ship to shore (back to CWB)
 - Shipboard weather observation reports
 - automatic & manual
 - AIS shore network assisted sharing

ECDIS

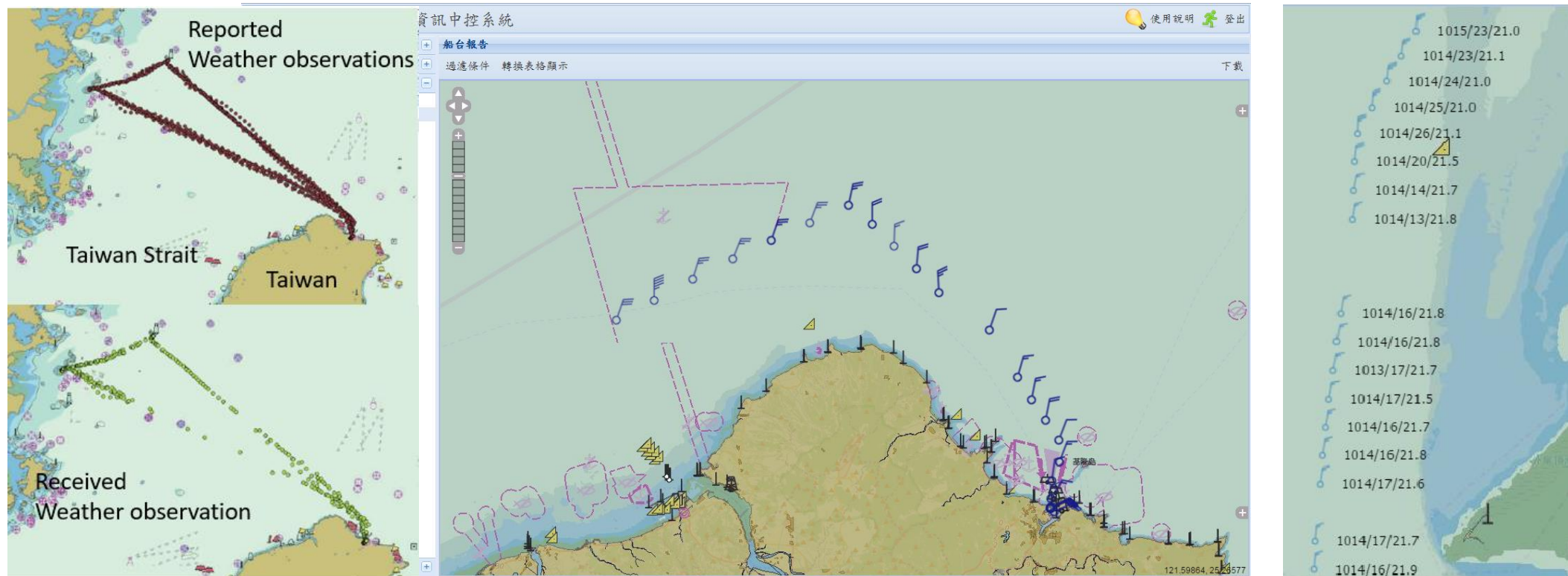


- AIS weather APP
 - receive via shipboard AIS or internet
- Regional ASM (CWB/NTOU)
 - Regional wind field forecast
 - Typhoon warnings



(AIS) Shipboard weather observation reports

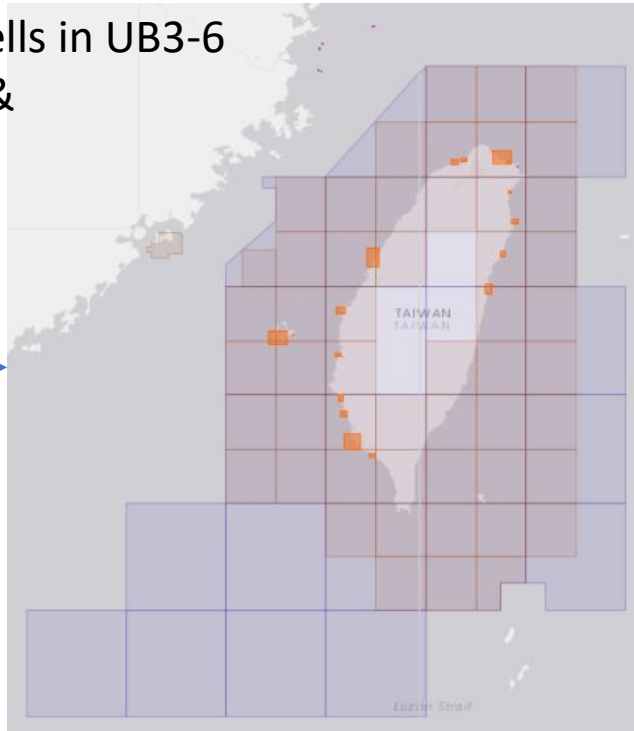
- CWB Project starting 2022 : participation by 100 more vessels



Location, Air Pressure & Temperature, Wind; every 10 min. (remote-controllable also via AIS ASM)

MOI's S-100 Digitalization Plan (2021-2026)

100 ENC Cells in UB3-6
Published &
maintained

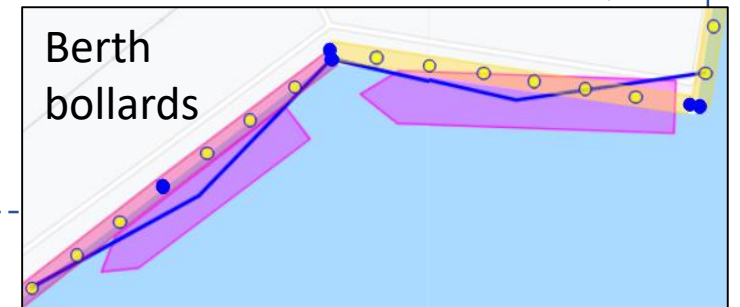
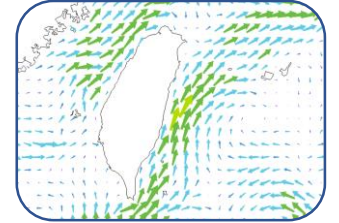


Aids to
Navigation

Notice to
Mariners

Navigational
Warnings

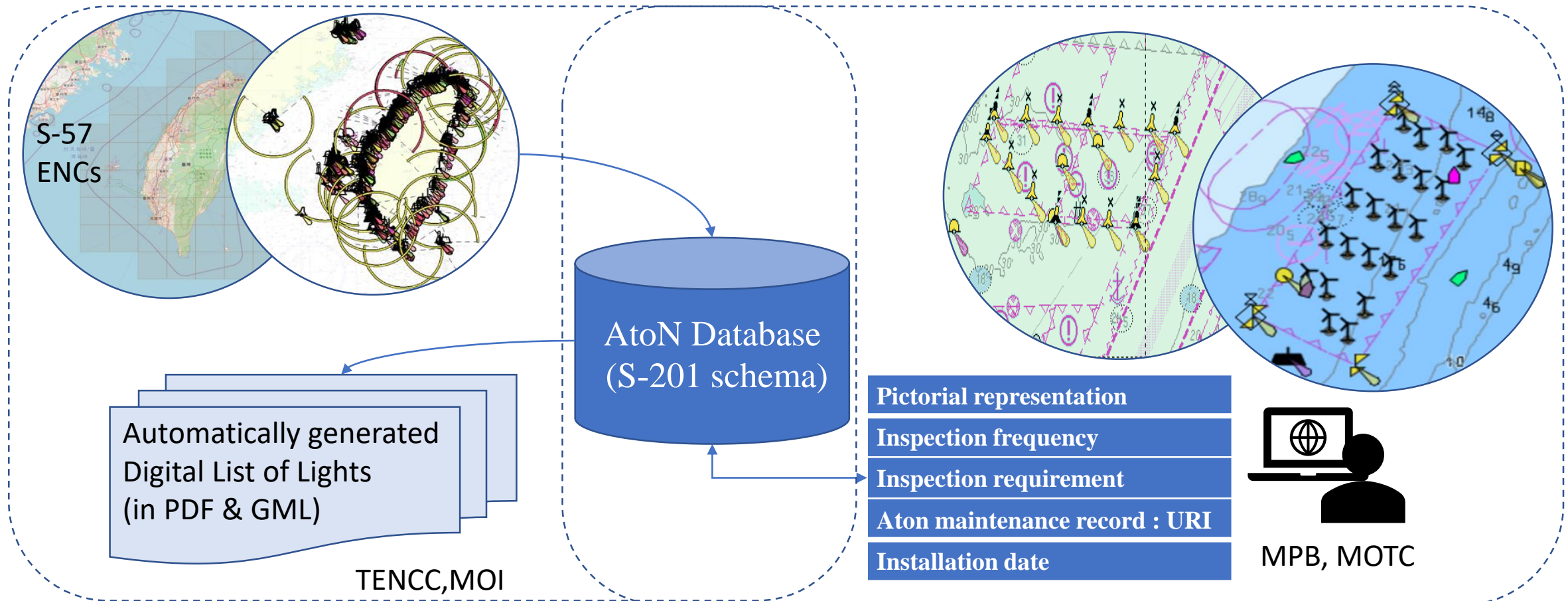
- S-101 ENC
- S-102 Bathymetric Surface
- S-111 Surface Current (CWB & MOI)
- S-127 Marine Traffic Management
- S-124 (Navigational Warnings)
- S-125 (Marine Navigation Service)
 - IALA S-201 (Aids to Navigation Info.)
- S-131 (Marine Harbour Infrastructure)
 - TPNet
-



Build up the cooperation & infrastructure ready for the products/services

AtoN database management and publication

- Web-assisted cooperation between authorities in AtoN management
 - add MRN & generate digital List of Lights (2021, MOI)

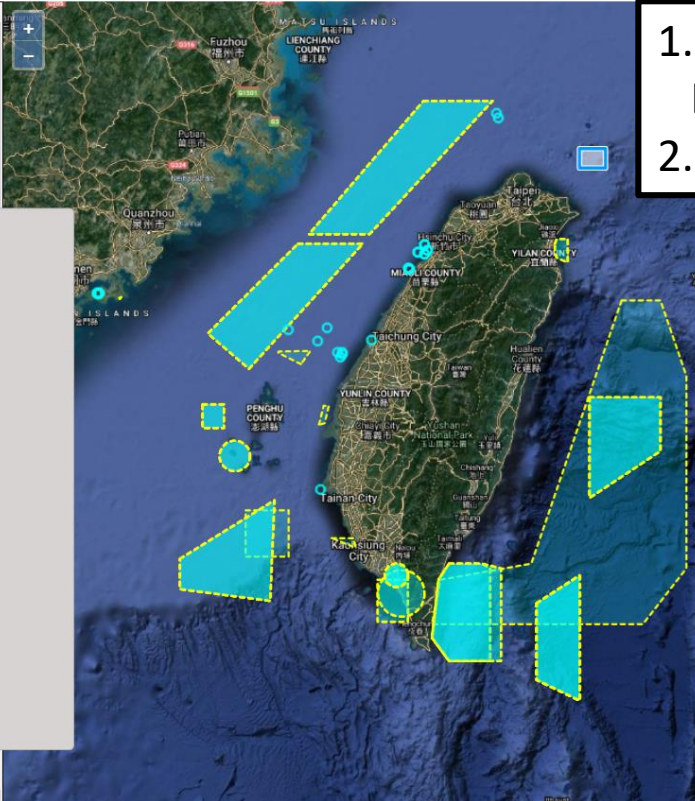


Enhance MSI service provision while testing S-124

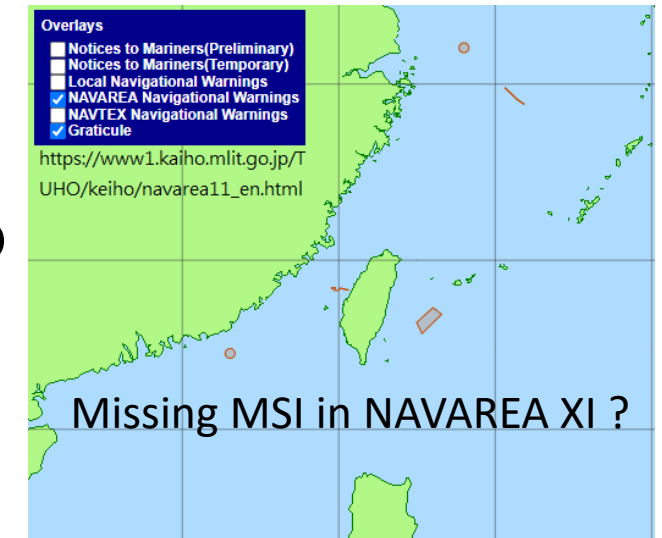
Broadcast Time: 2021/11/03 ~ 2021/11/05 Keyword: SEARCH

Show Date: 2021-11-03 ~ 2021-11-05

ID	Subject	Publication Date
<input type="checkbox"/> 0688.21	SAILING CHAMPIONSHIP	2021-11-04
<input type="checkbox"/> 0687.21	FIRE PRACTICES	2021-11-03
<input checked="" type="checkbox"/> 0686.21	GUNNERY	ZCZC PA73 010230UTC NOV 2021 TAIWAN NAVTEX N.W.NR0686/2021 GUNNERY 0100UTC-0230UTC DAILY 3,4,5 NOV AREA BOUNDED BY 24-24N 122-20E 24-24N 122-38E 23-52N 122-50E 22-30N 122-50E 22-06N 122-30E 22-06N 120-52E 22-25N 120-56E 22-32N 121-38E NNNN
<input type="checkbox"/> 0685.21	FIRE PRACTICES	
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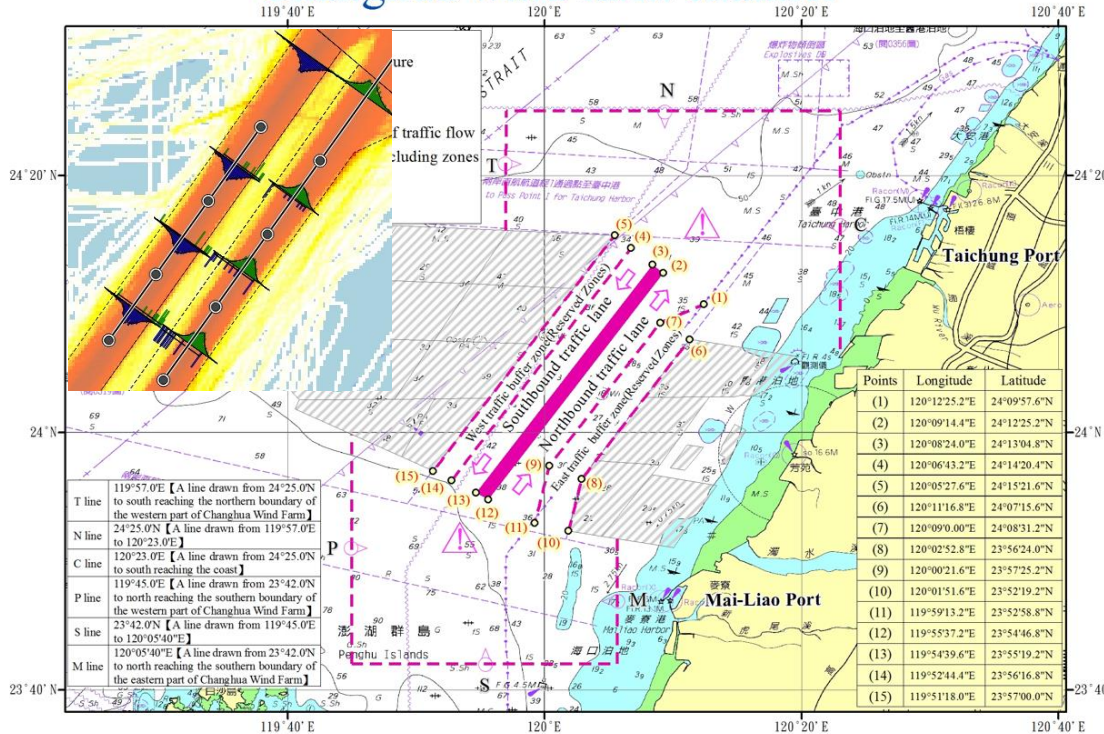
1. Parse daily NAVTEX to extract time & geometry
Publish on the web for query & management
2. Assist editing MSI (text) in the digital way



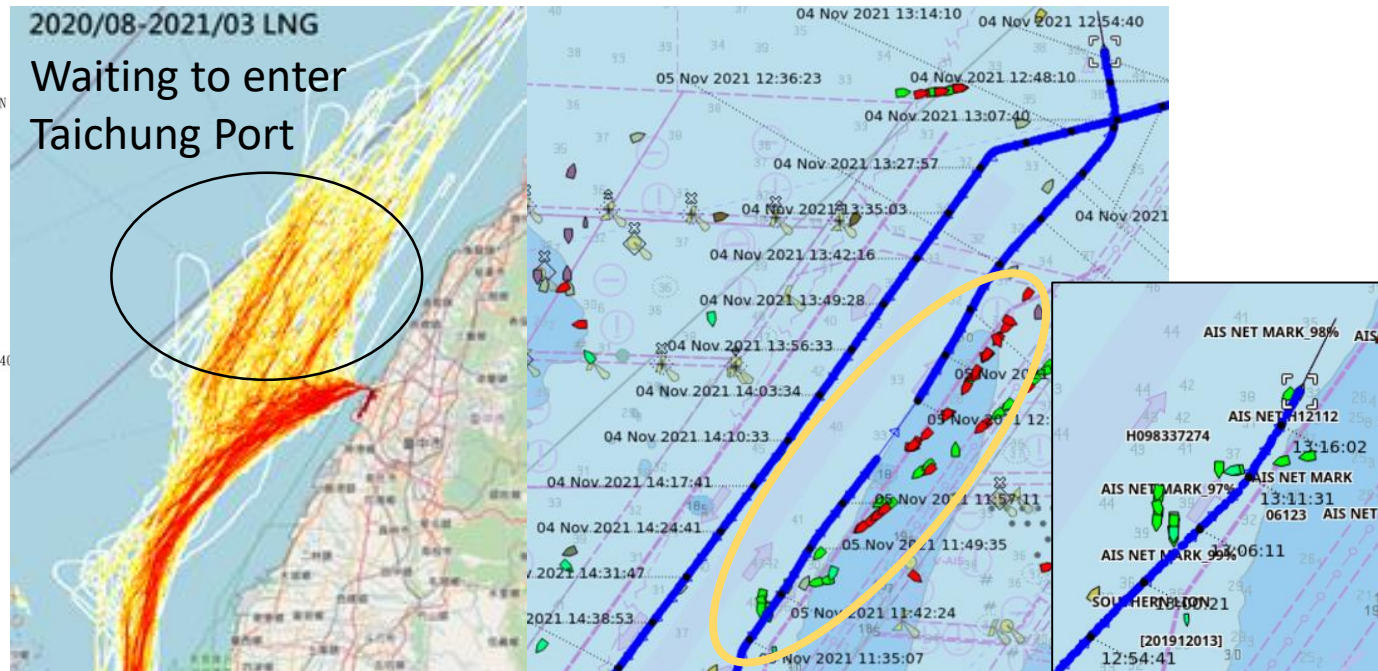
- Digitalization of NAVTEX broadcast by Keelung Radio
 - MSI(NAVTEX) → S-124 (data structures), generate MSI(NAVTEX) from S-124 based editing
- Digitalization of MPB's Notice to Mariners published on the web
 - Re-design the SOPs and publication system (automated by parsing functions)

Challenges : offshore wind farms, weather...

Changhua wind farm channel



- 8 hours Pre-Arrival Notification required
- Near Ports of Taichung and Mailiao at both ends
- OWFs under construction on both sides
 - Laying cables across the channel
- Navigation difficulty (NE monsoon, Typhoon)
- Fishing boats & fishing gear/nets (AIS Net Marks)



Violations of regulation or entry into OWF areas are mostly due to lack of "information" (not using Taiwan ENC's or not updating charts)

Further developments

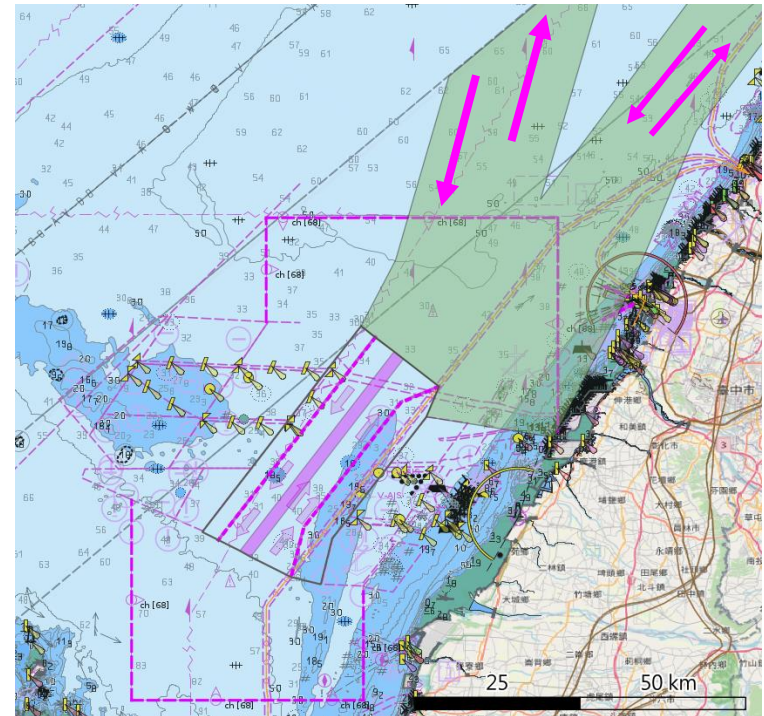
- The Intelligent Navigation Safety Service Development Plan (MPB)

- 1.0 (2020-2023)

- Integrate 19 systems /information sources
 - Establish Changhua VTS and the Maritime Center
 -

- 2.0 (2024-2027)

- Under planning



- Phase 3 Offshore Wind Farm Development (2026-2035)
More OWFs to be developed offshore Changhua and northward

We believe there are very good opportunities where
e-Navigation & Digital@Sea can really help
to tackle the challenges.

We look forward to international cooperation.

Thanks for your attention.