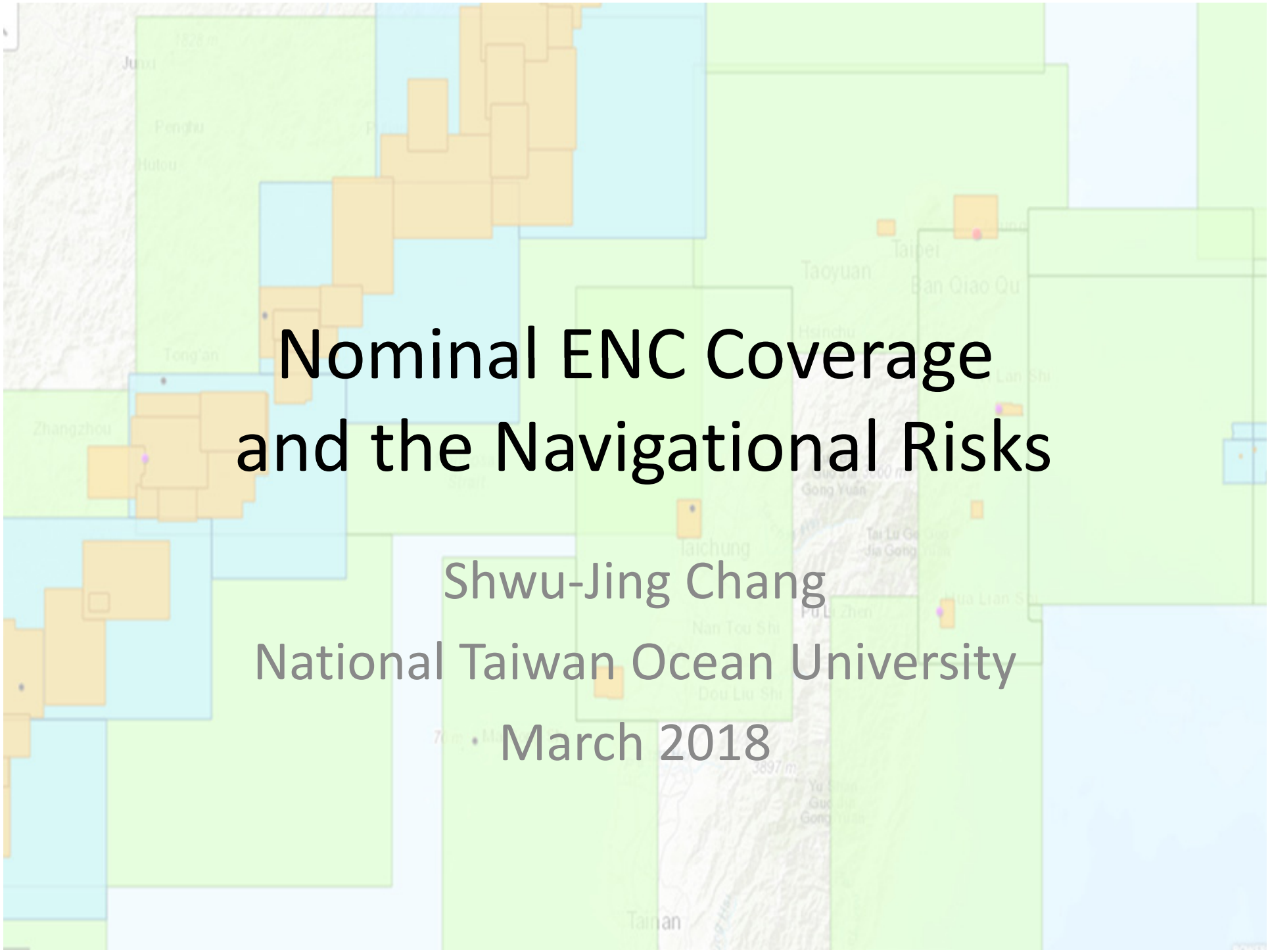


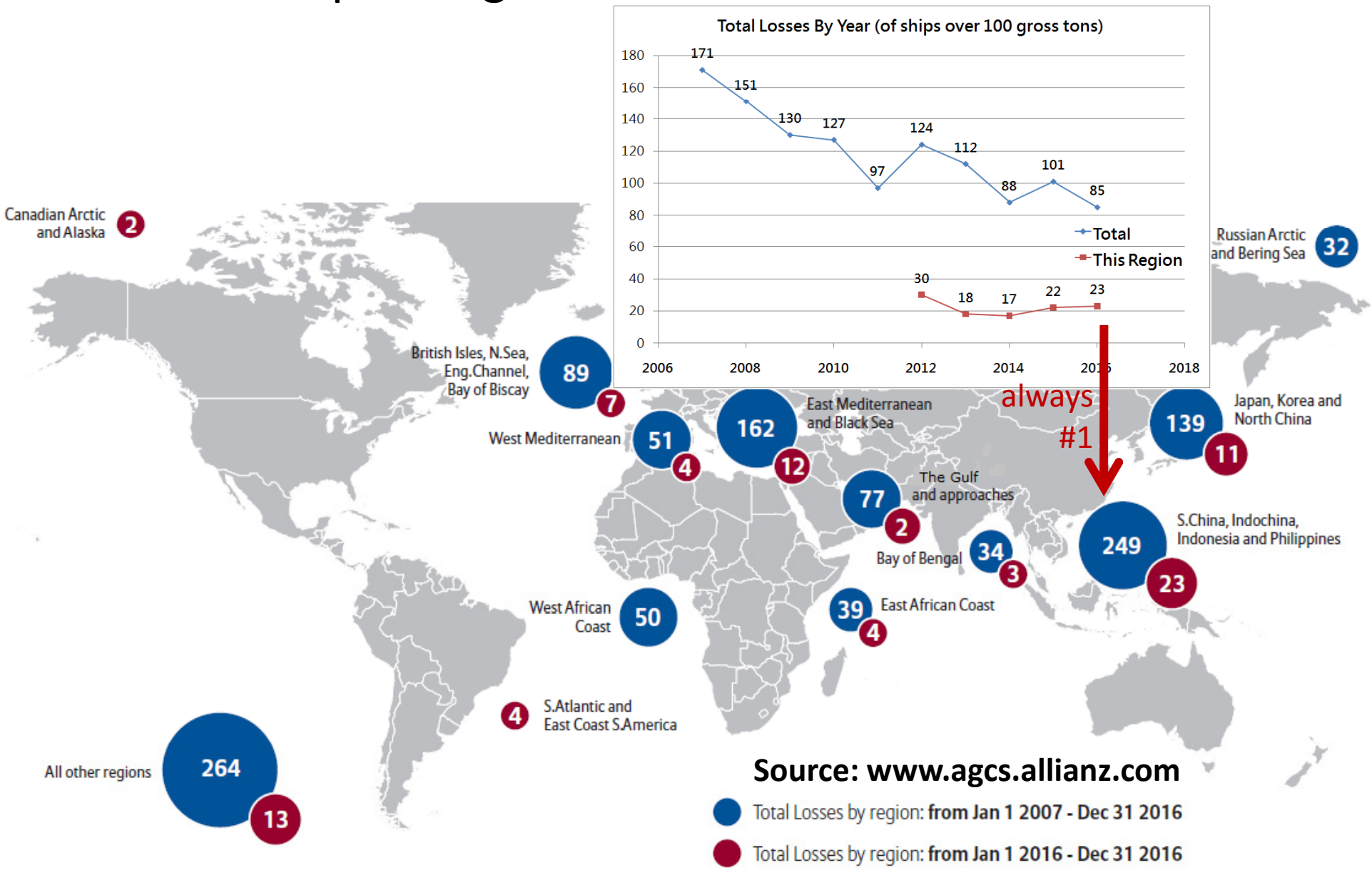
Nominal ENC Coverage and the Navigational Risks

Shwu-Jing Chang
National Taiwan Ocean University

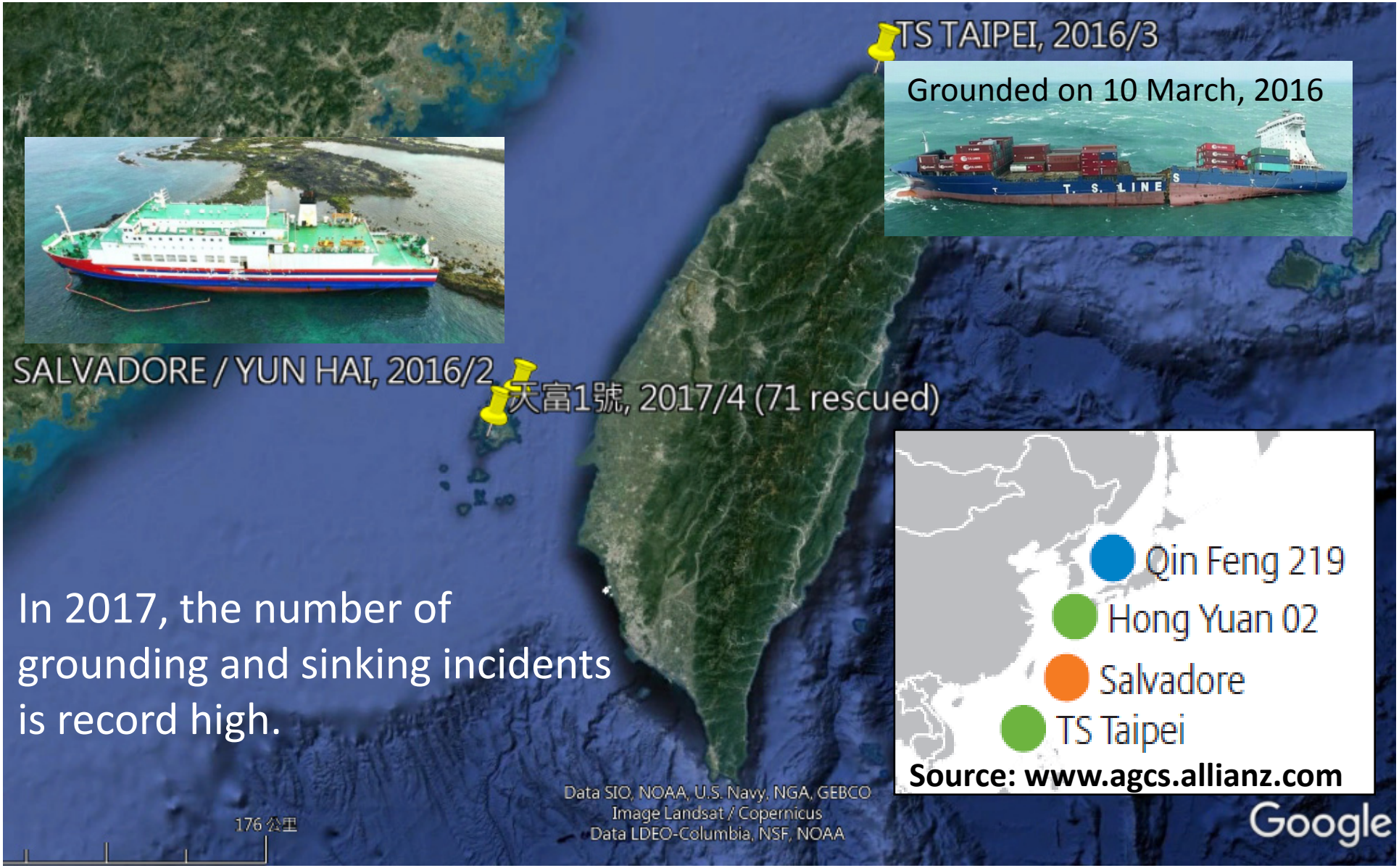
March 2018

Total loss by year (of ships over 100 gross tons)

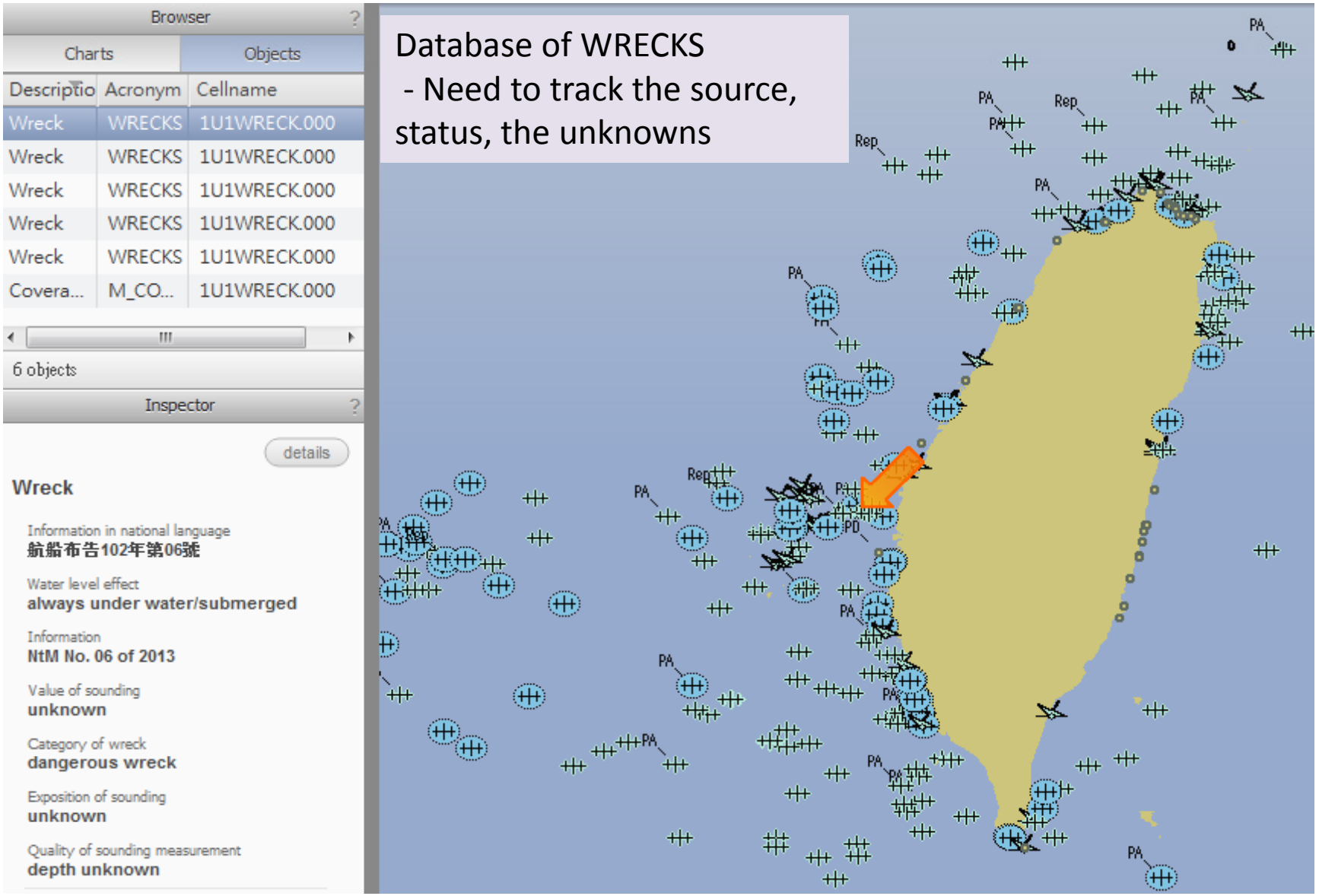
Top 10 regions : 2007-2016 and 2016



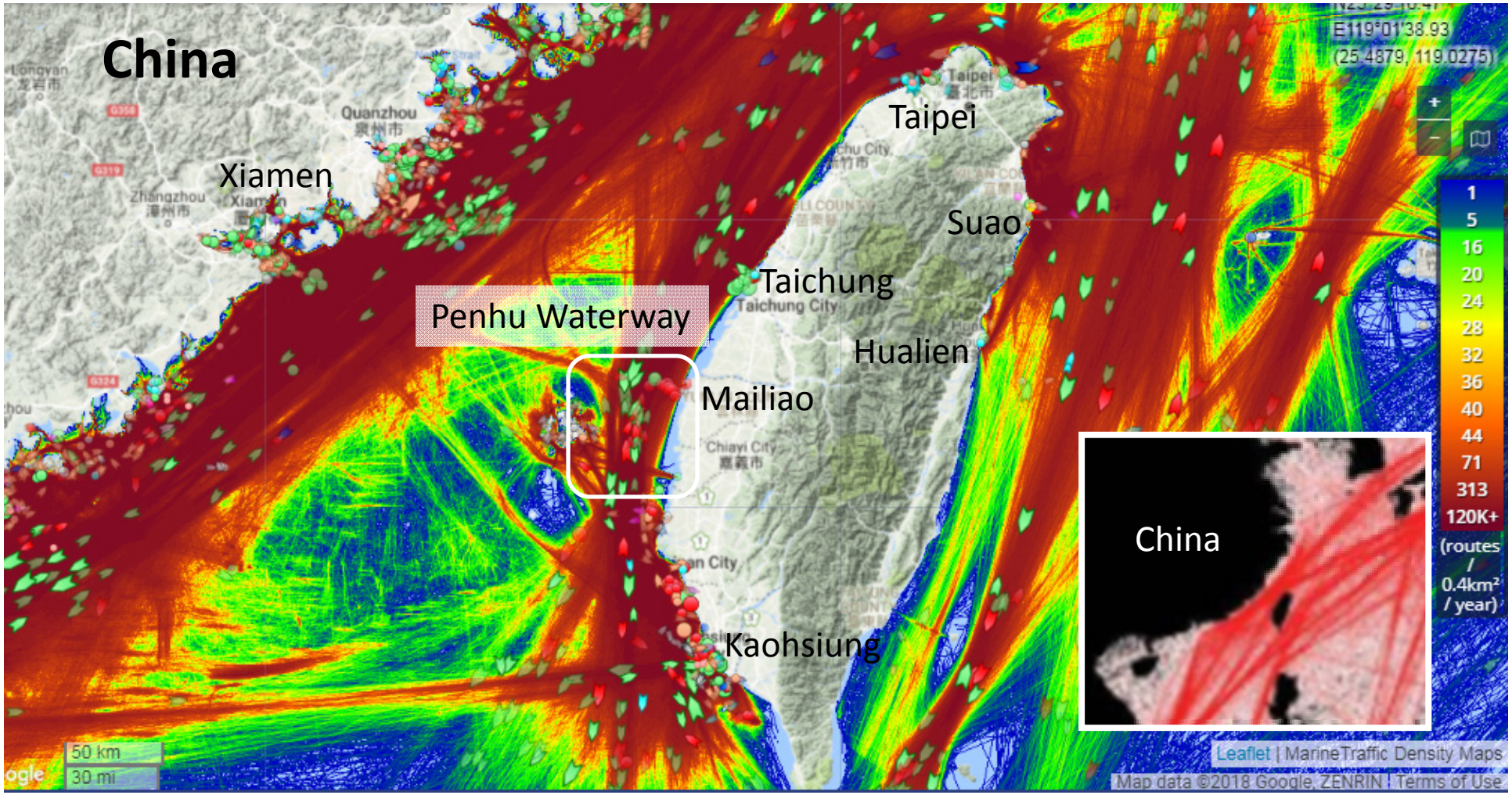
Among the 10 largest losses in 2016
→ 2 occurred in Taiwan



Each grounding or sinking has its implication to navigational charts



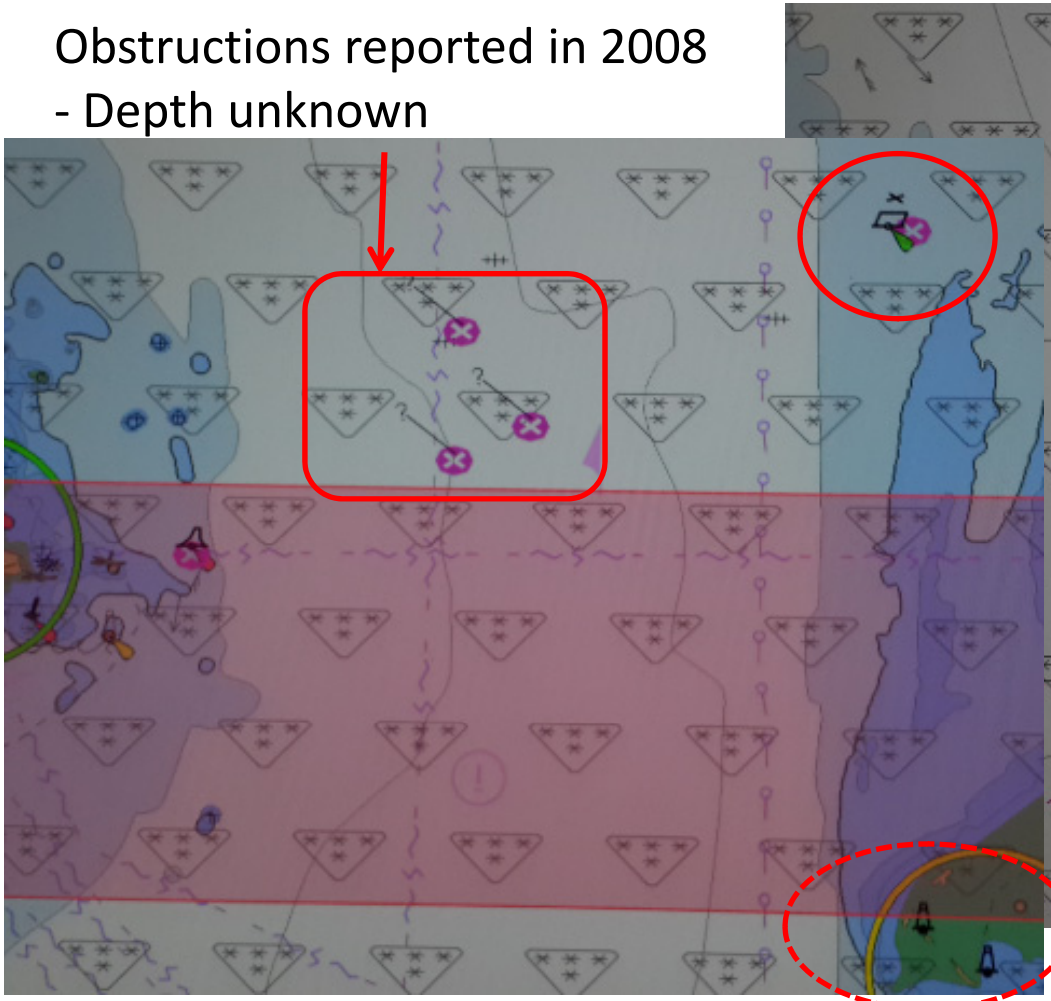
Marine Traffic Density & Routes



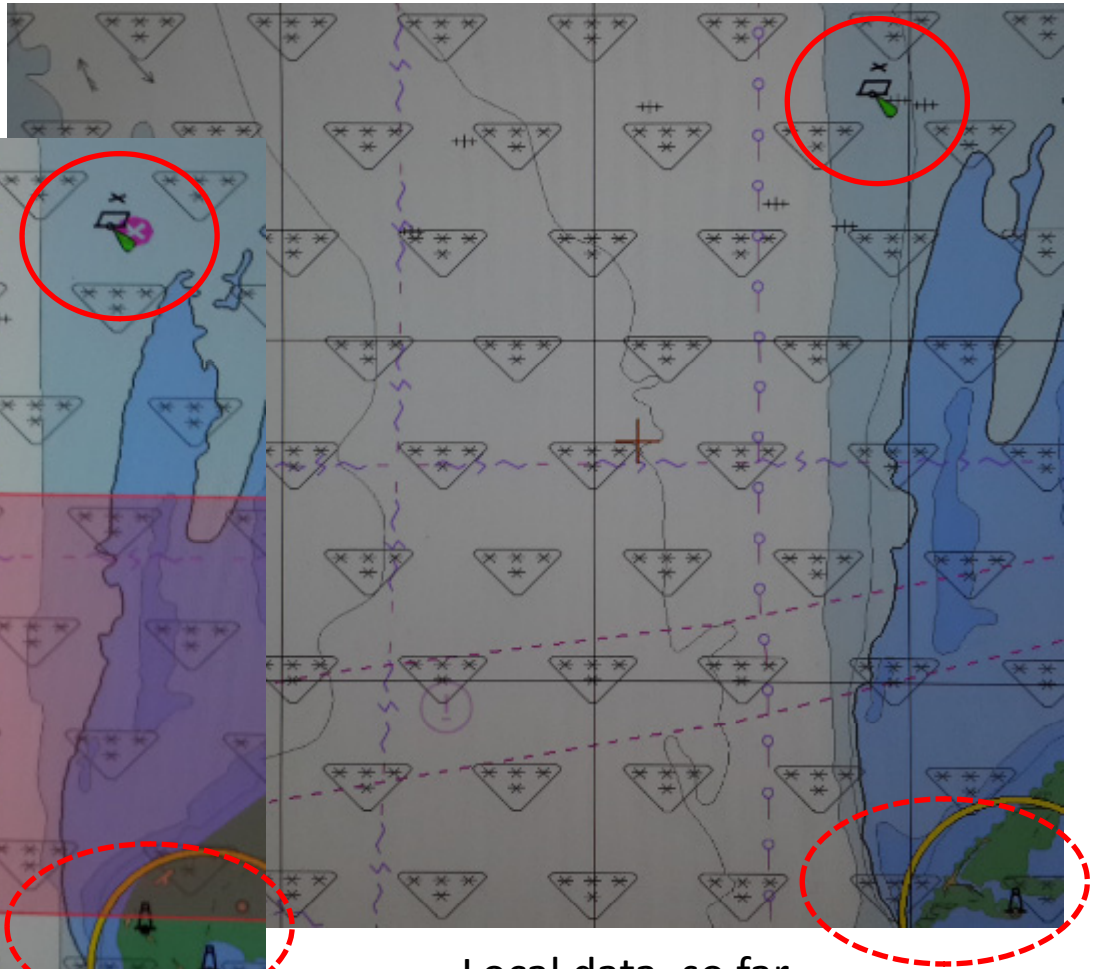
Source: https://www.marinetraffic.com/

Wrecks /Obstructions in Penghu Waterway
How many ? Dangerous or not ?

Obstructions reported in 2008
- Depth unknown



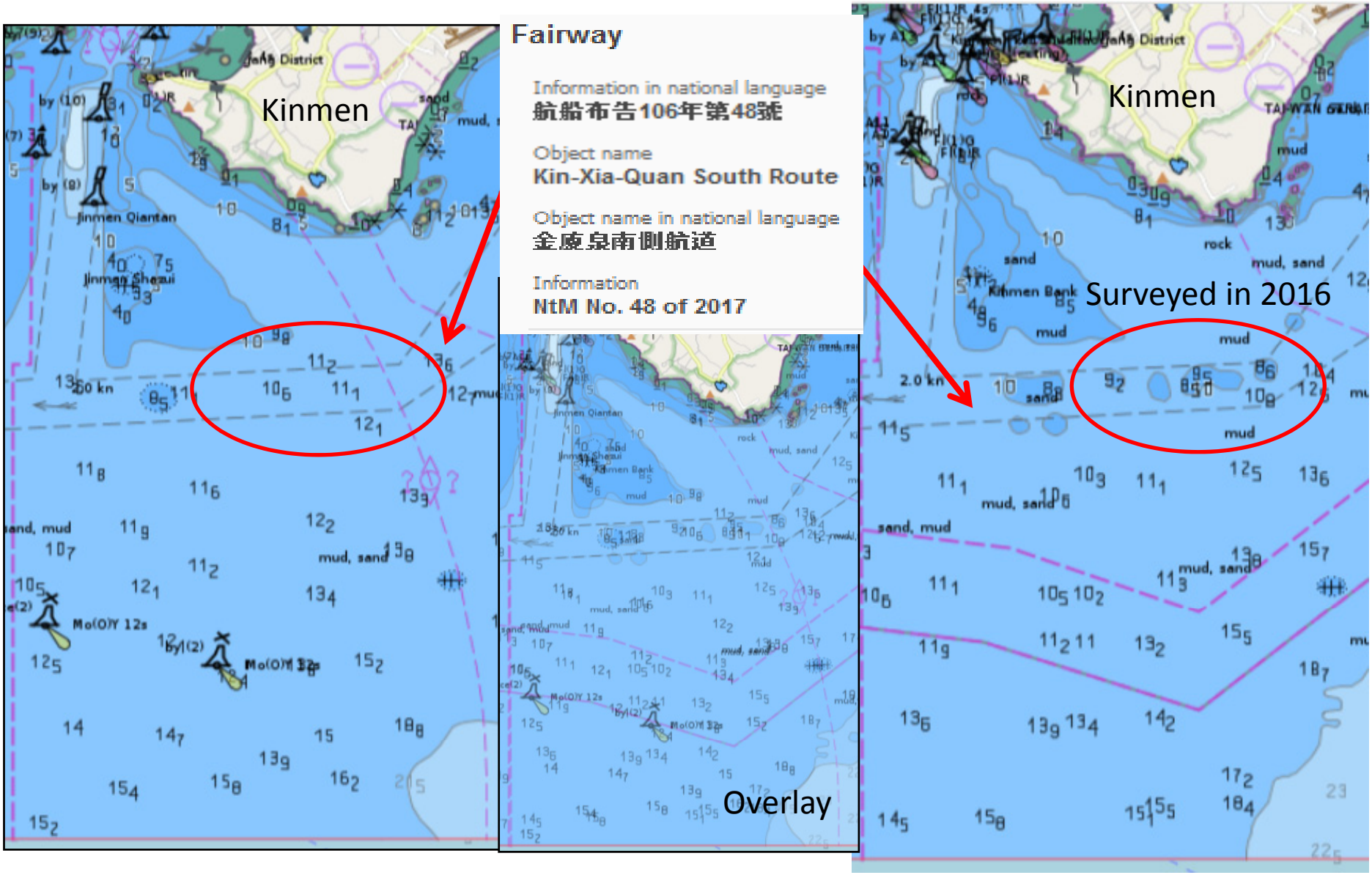
AVCS



Local data, so far

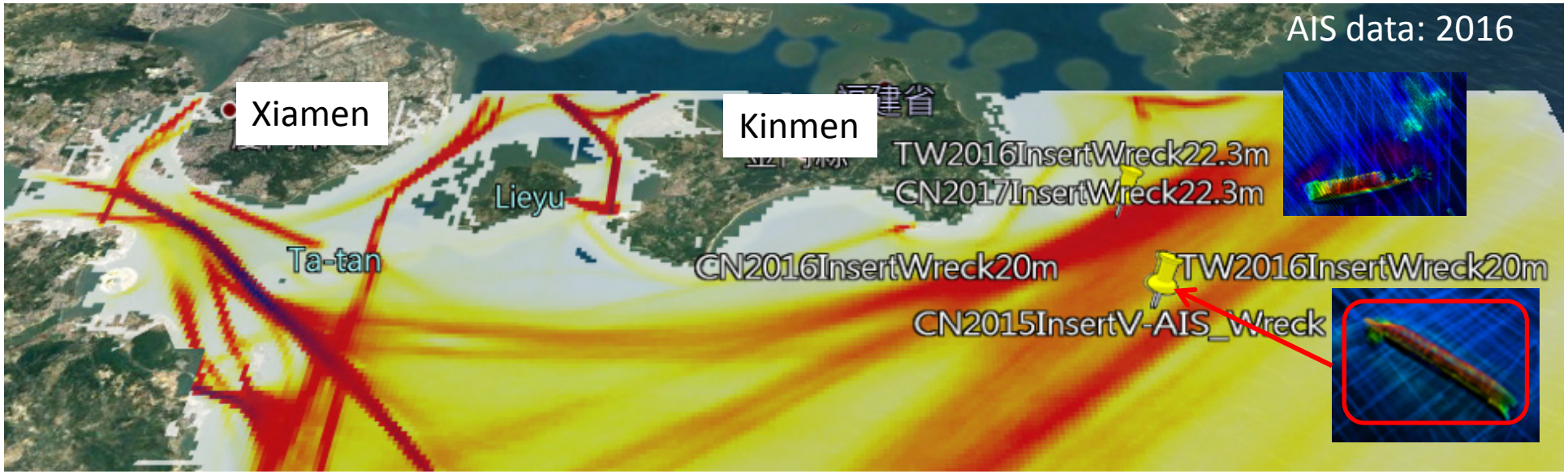
ENCs of the same area can be very different

for various reasons, including lack of info. exchange



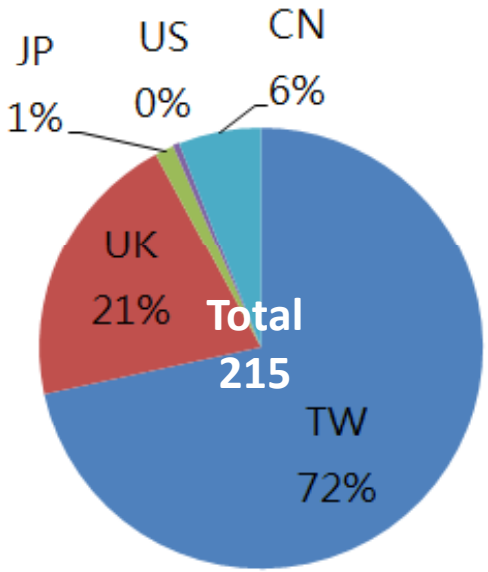
NtM history of an ‘unreported’ wreck

- 2016 hydro. survey found wrecks & issued NtMs in Oct.
  - 2016 wk49 CN NGD NtM: insert wreck, 20m
  - 2016 wk49 UK NtM: insert wreck,20m & replace V-AIS
- 2017 NtM survey noticed: it’s marked with V-AIS in 2015
  - 2015 wk28 CN NtM: insert V-AIS, named “Min Guang 188 wreck”
  - 2015 CN NtM wk34: move V-AIS

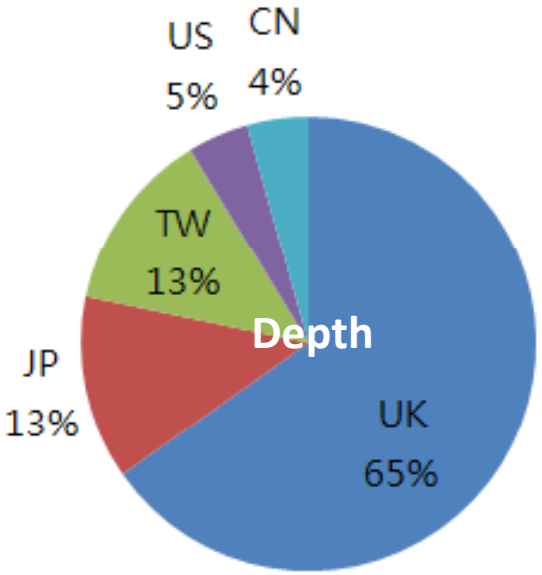


Regional NtM Survey for Chart Corrections

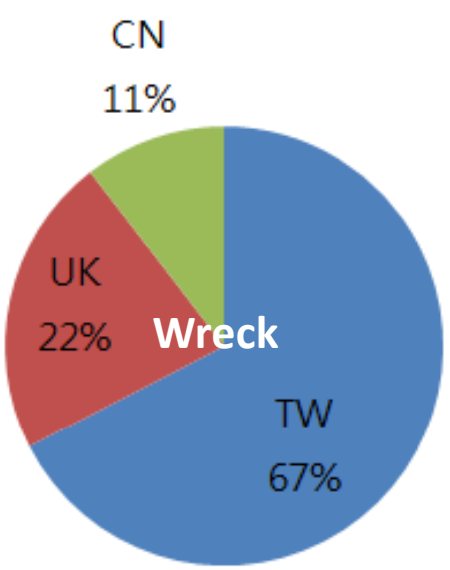
(analyzed based on CN NGD NtMs, 2009~ 2017 wk24)



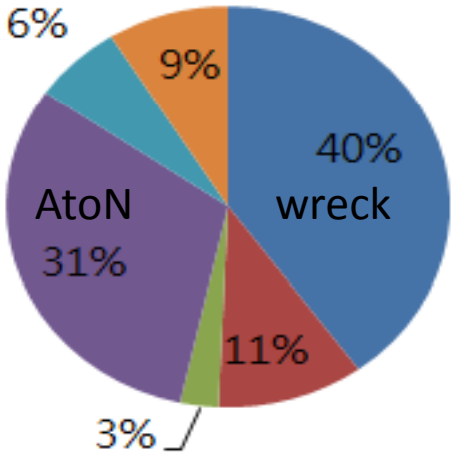
NGD NtM Source (around Taiwan and Peng-Hu Isl

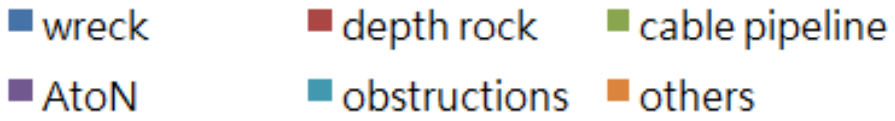


(Depth: 23 NtMs)



(Wreck, 86 NtMs)

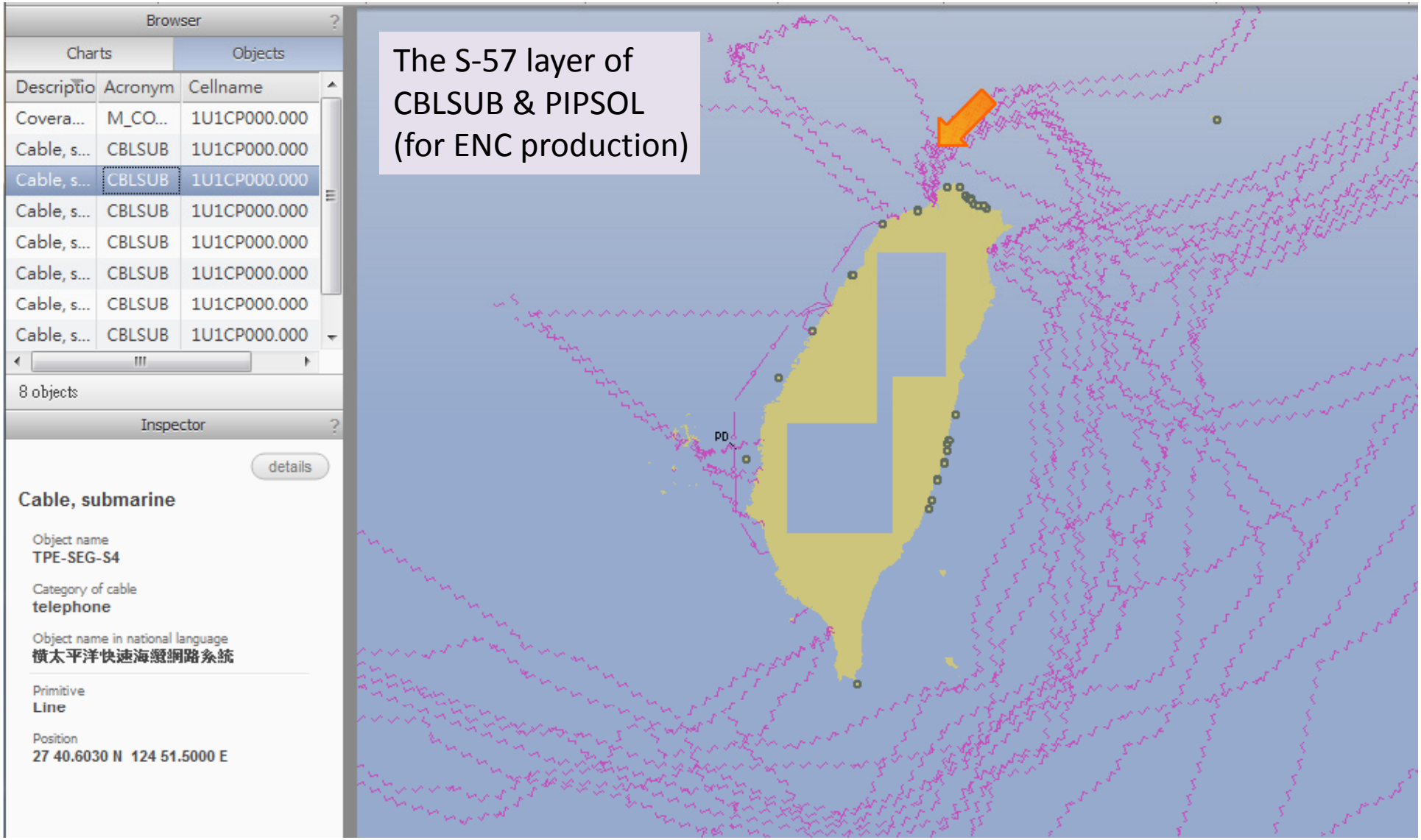




Taiwanese NtMs of NMOO:
usually only base one local sources & when formally informed

Those NtMs on Submarine Cables & Pipelines

are all from Taiwanese source



An Example of NtM-Caused Error

- Two pilot boarding place ?

Source: Taiwanese Notice 71/13

Hualien Harbor Offshore –
Newly Established of Pilot Station

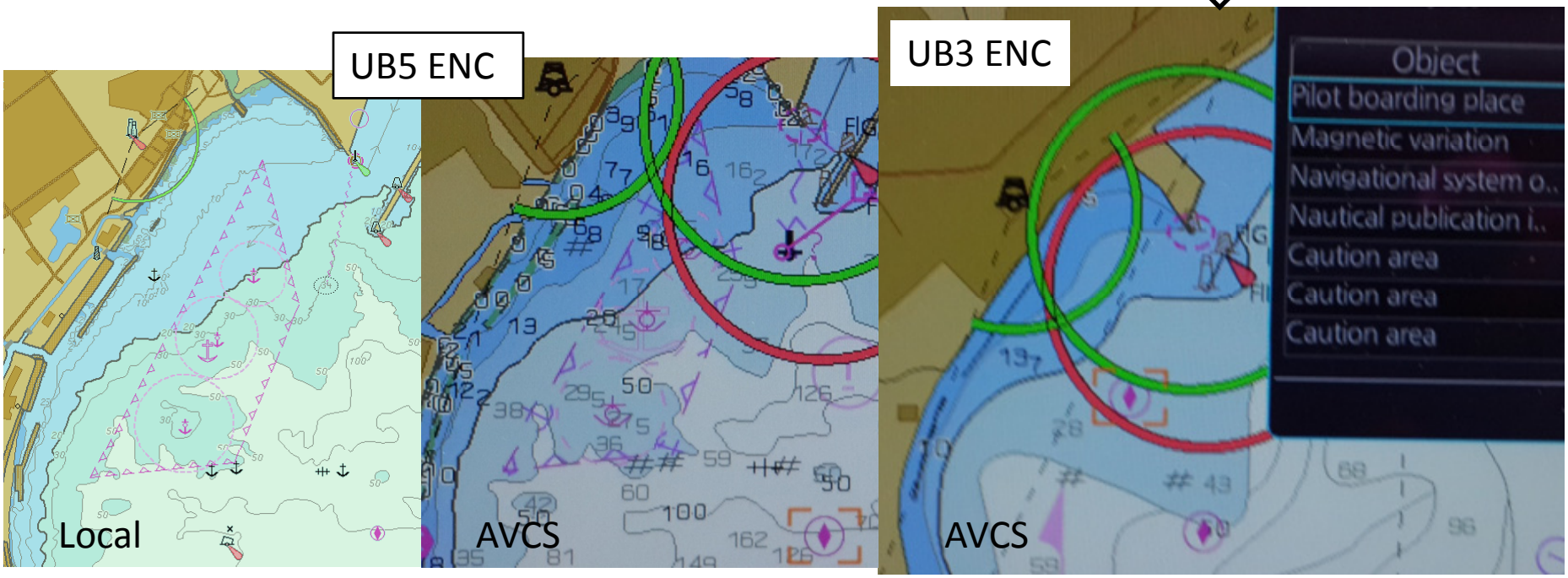
Position - Lat.23°57'11.0"N., Long.121°37'41.0"E. (WGS84)
Lat.23°57'17.6"N., Long.121°37'11.7"E. (GRS67)

Details - A pilot station has been newly established at the above position. NMOO chart users are advised to add the related charts & publications.

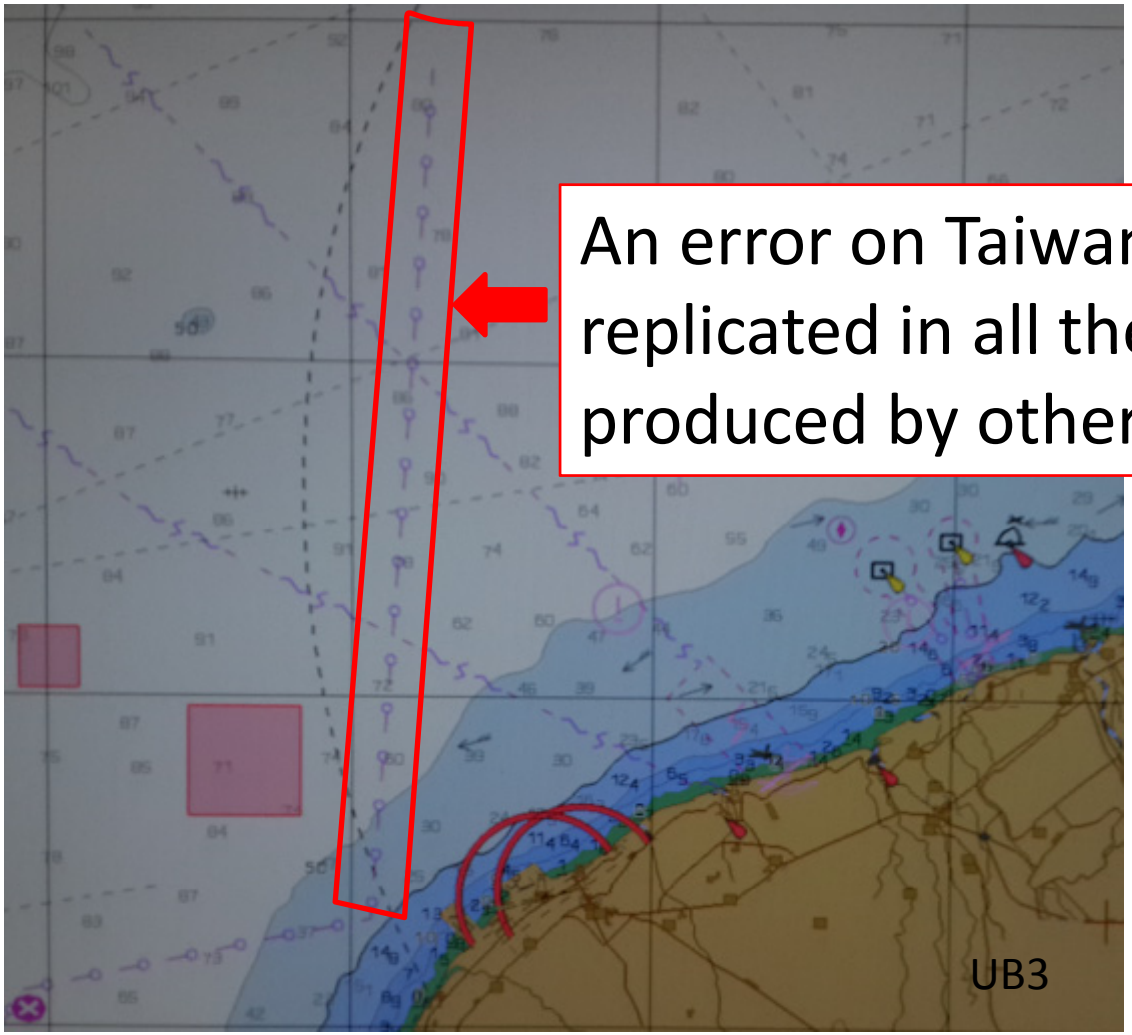
NGD NtM

加繪

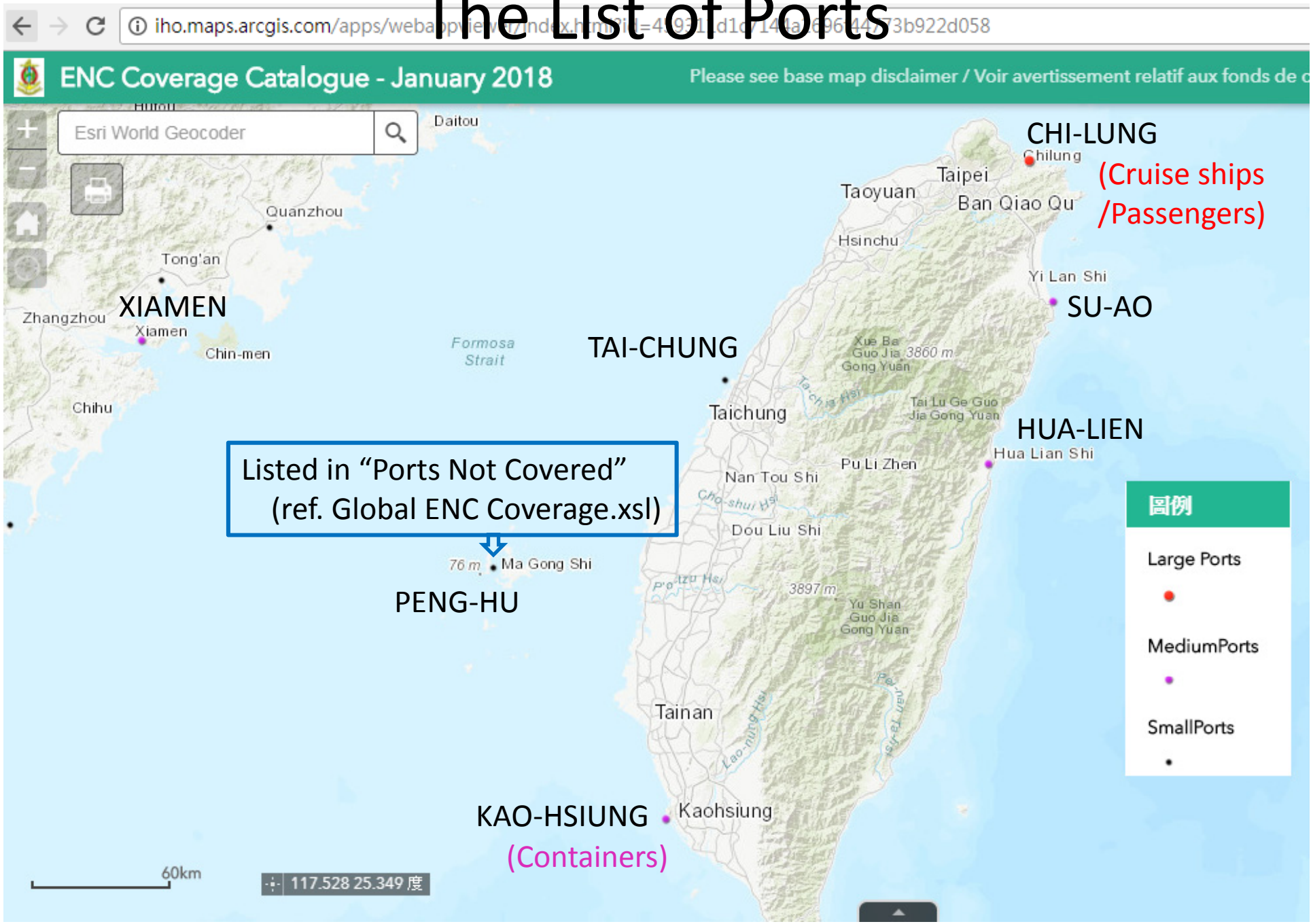
Insert (UKHO)



Known paper chart error might not have any NtM issued for it

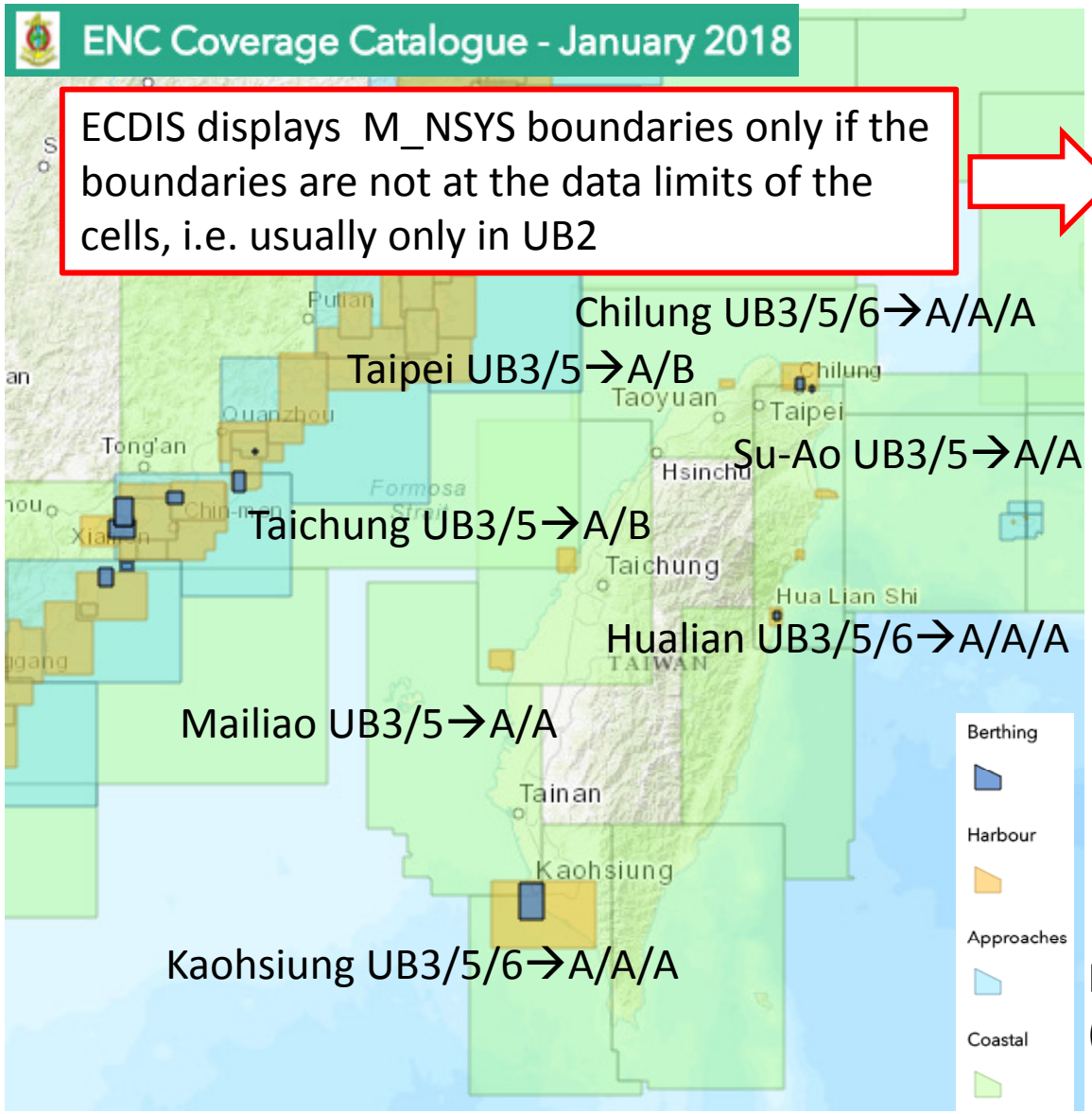


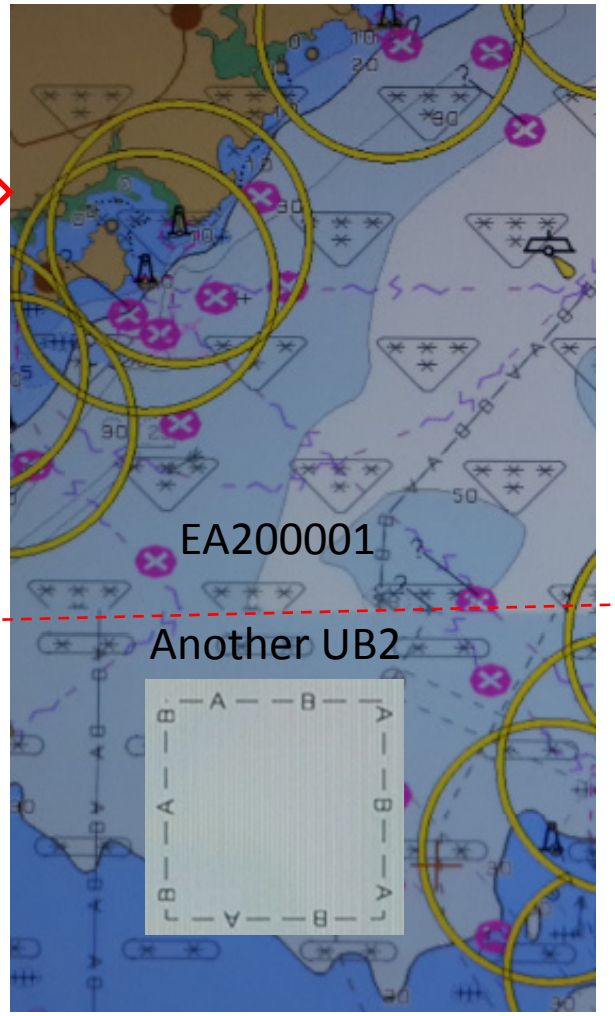
The List of Ports



IALA Buoyage System → in fact, B region

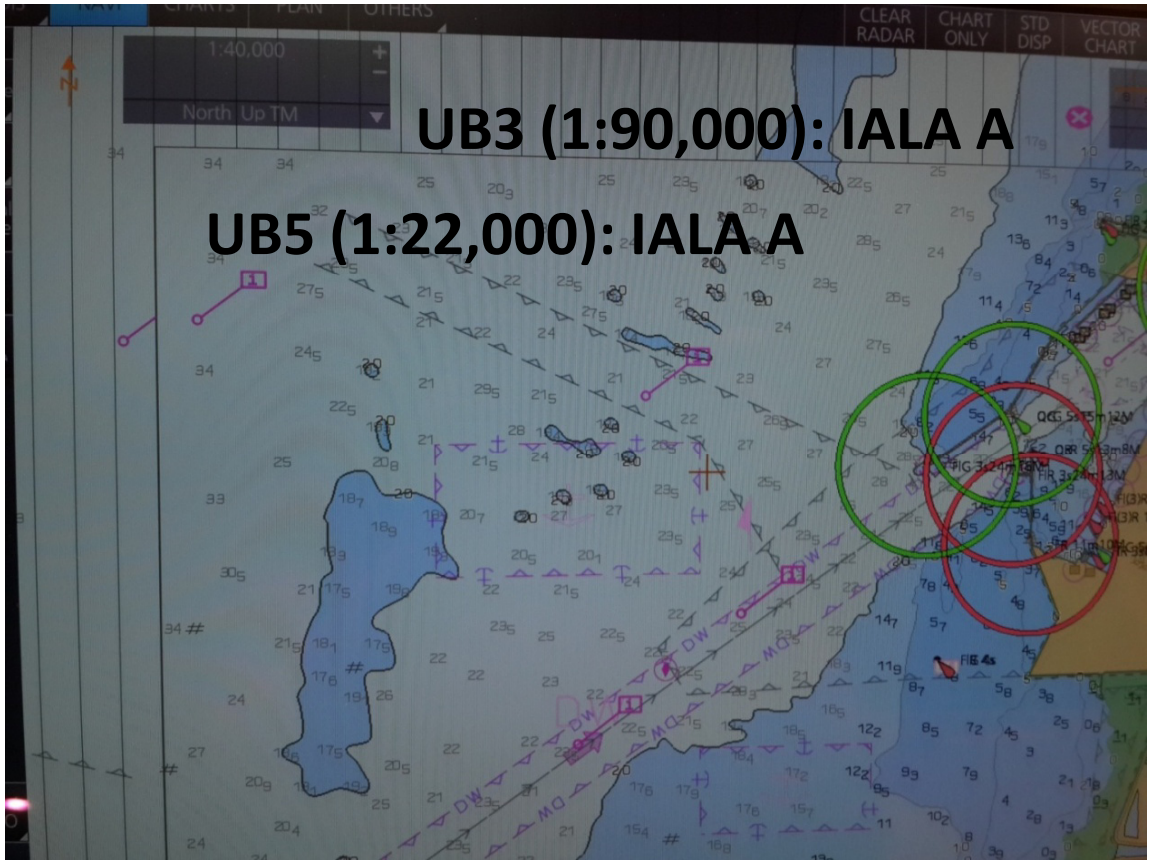
What do mariners see on ECDIS now?

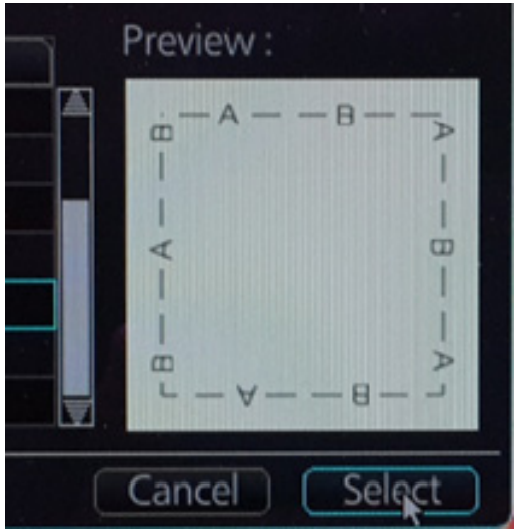




M_NSYS, mandatory in ENC cells (Navigational System of Marks)

MAI-LIAO Industrial Port (Tanker, VLCC), not listed
ENC Status UB3→UB5: IALA A→A



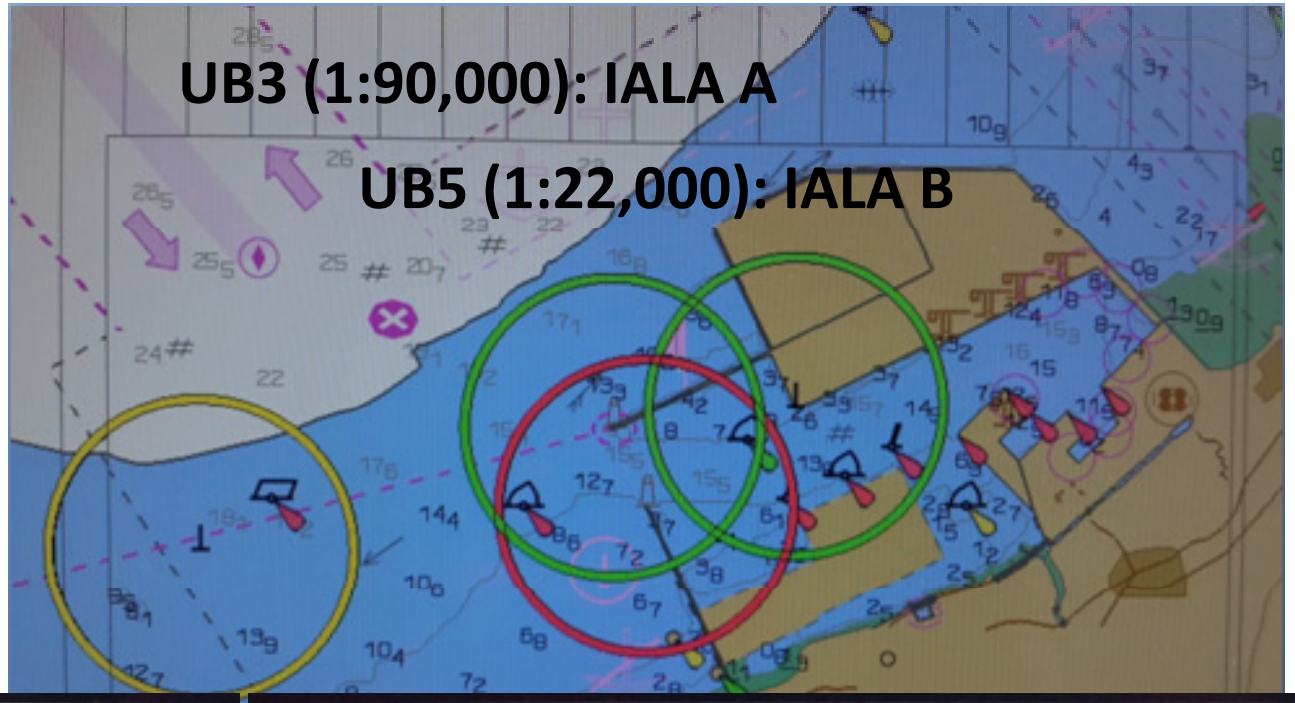


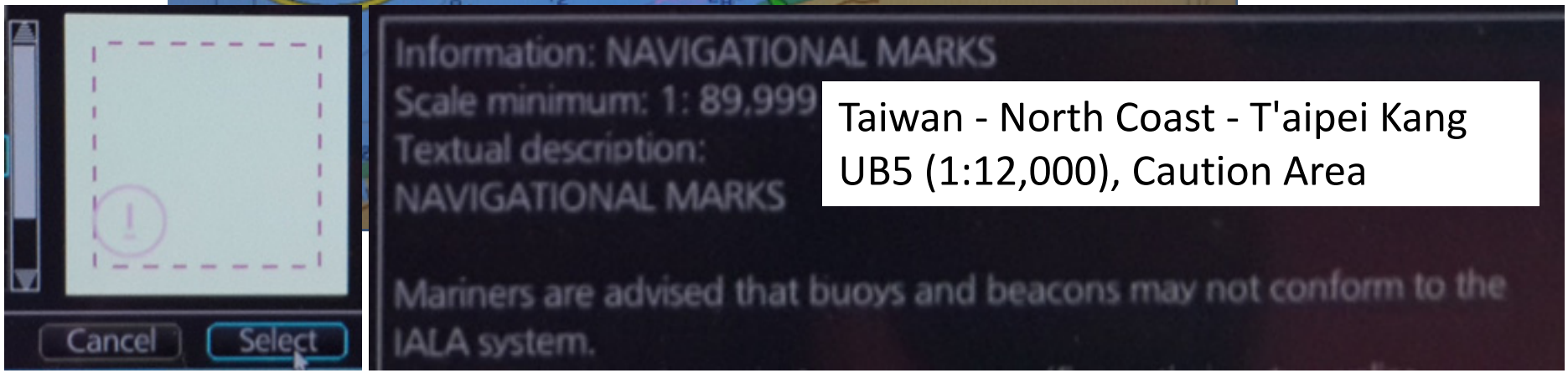
Marks navigational - System of: IALA A
Symbol explanation:
boundary between IALA-A and IALA-B systems of lateral buoys and beacons

In fact, IALA B !!

Taipei port (expanding, not listed)

ENC Status UB3→UB5: IALA A→B



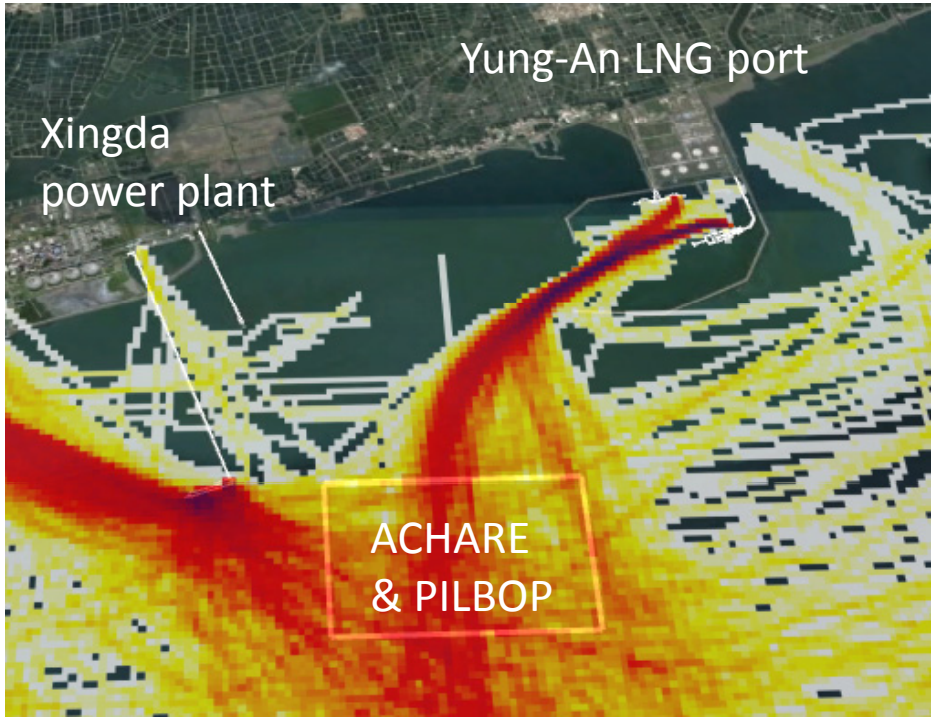


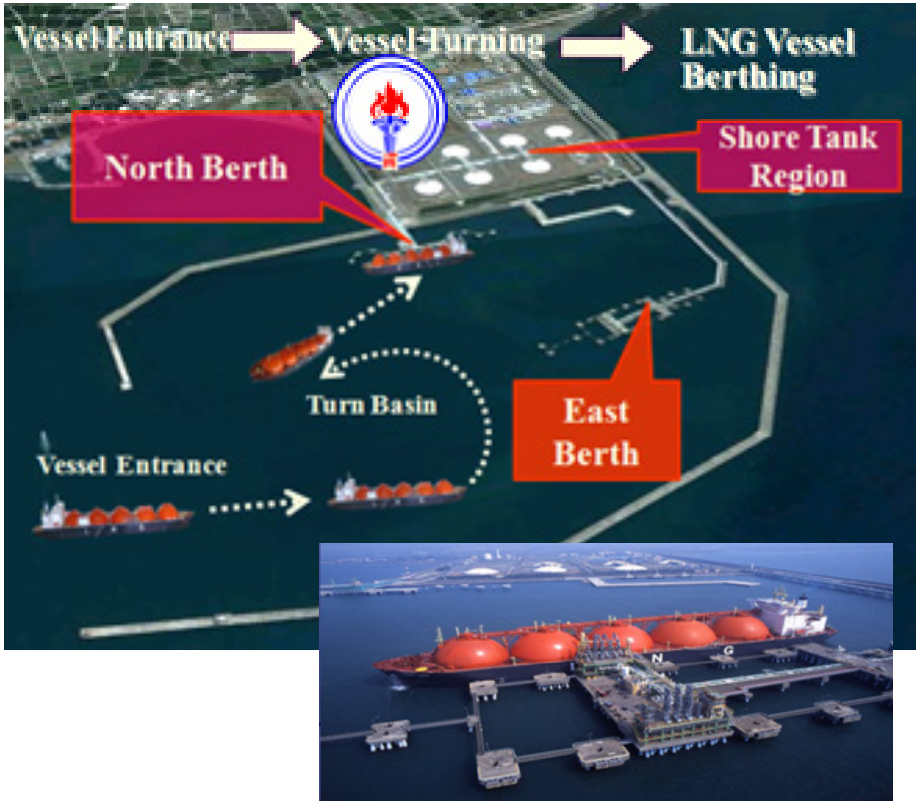
Taiwan - North Coast - T'aipei Kang
UB5 (1:12,000), Caution Area

Yun-An LNG Port/Terminal

- A safety critical request for a suitable chart

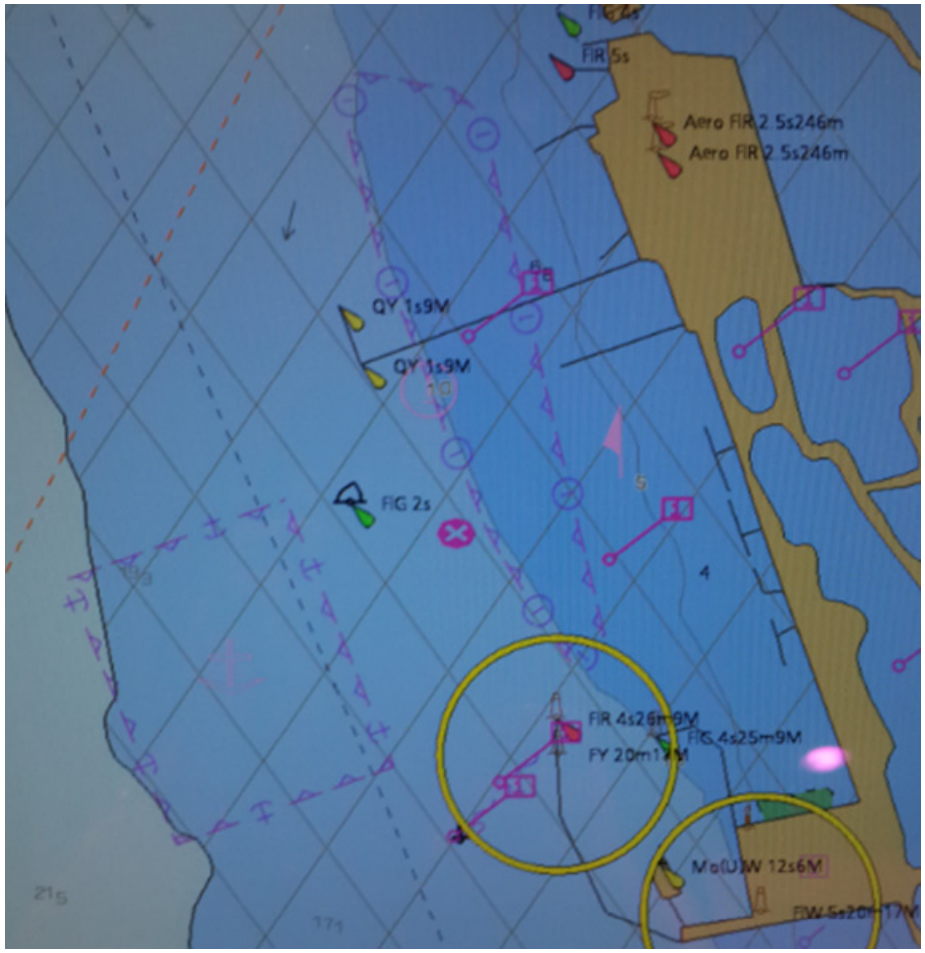
- "For now, large LNG vessels more or less sail with pilot's advice and an overview chart with no details on it."





Available Charts (the largest scale)

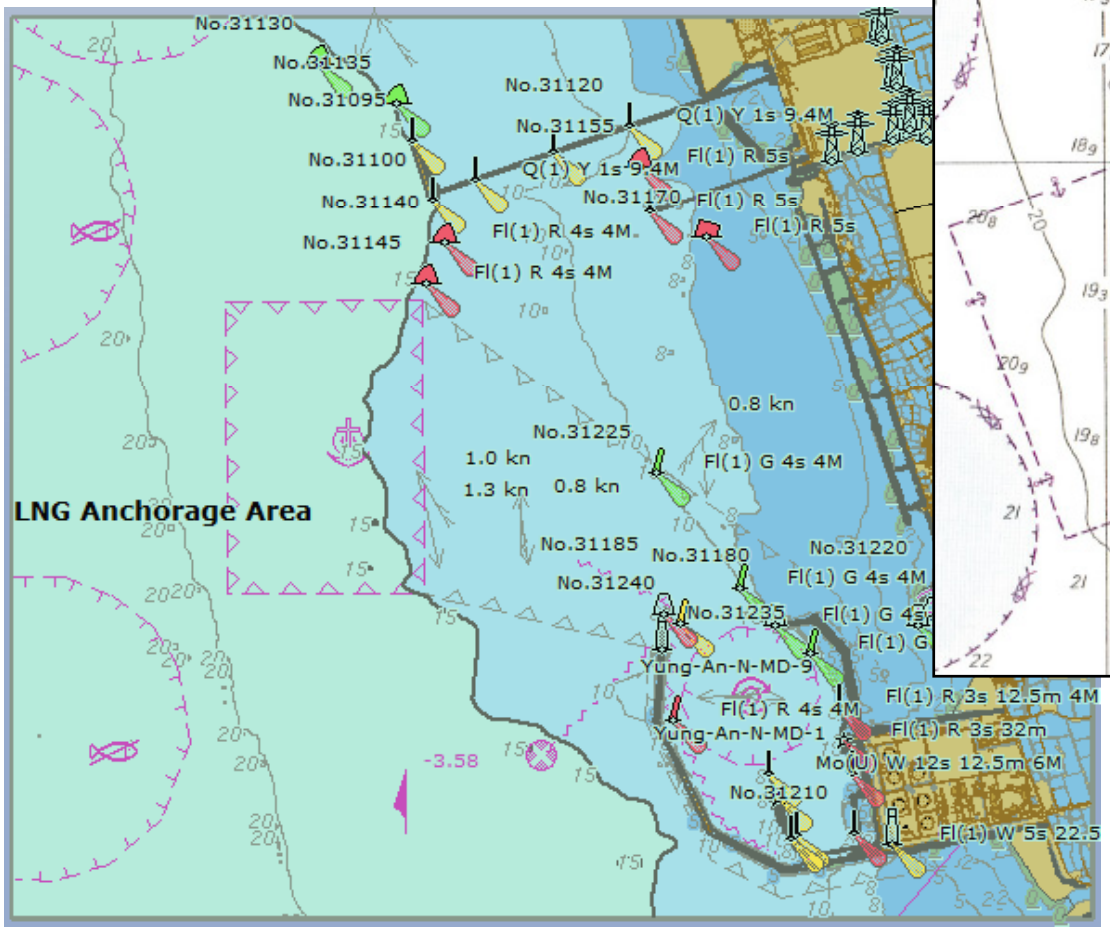
1:150,000 paper chart

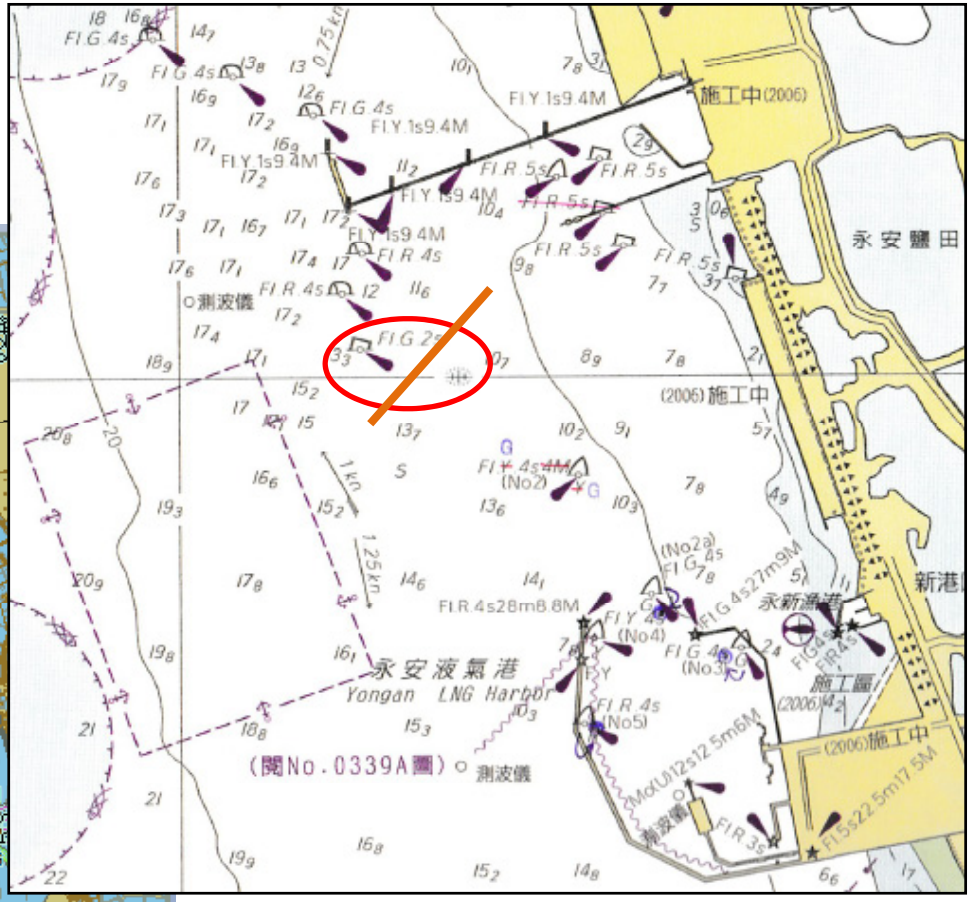


UB3 ENC (AVCS)

Locally Produced & Updated Charts

UB5 ENC based on latest survey (2017)

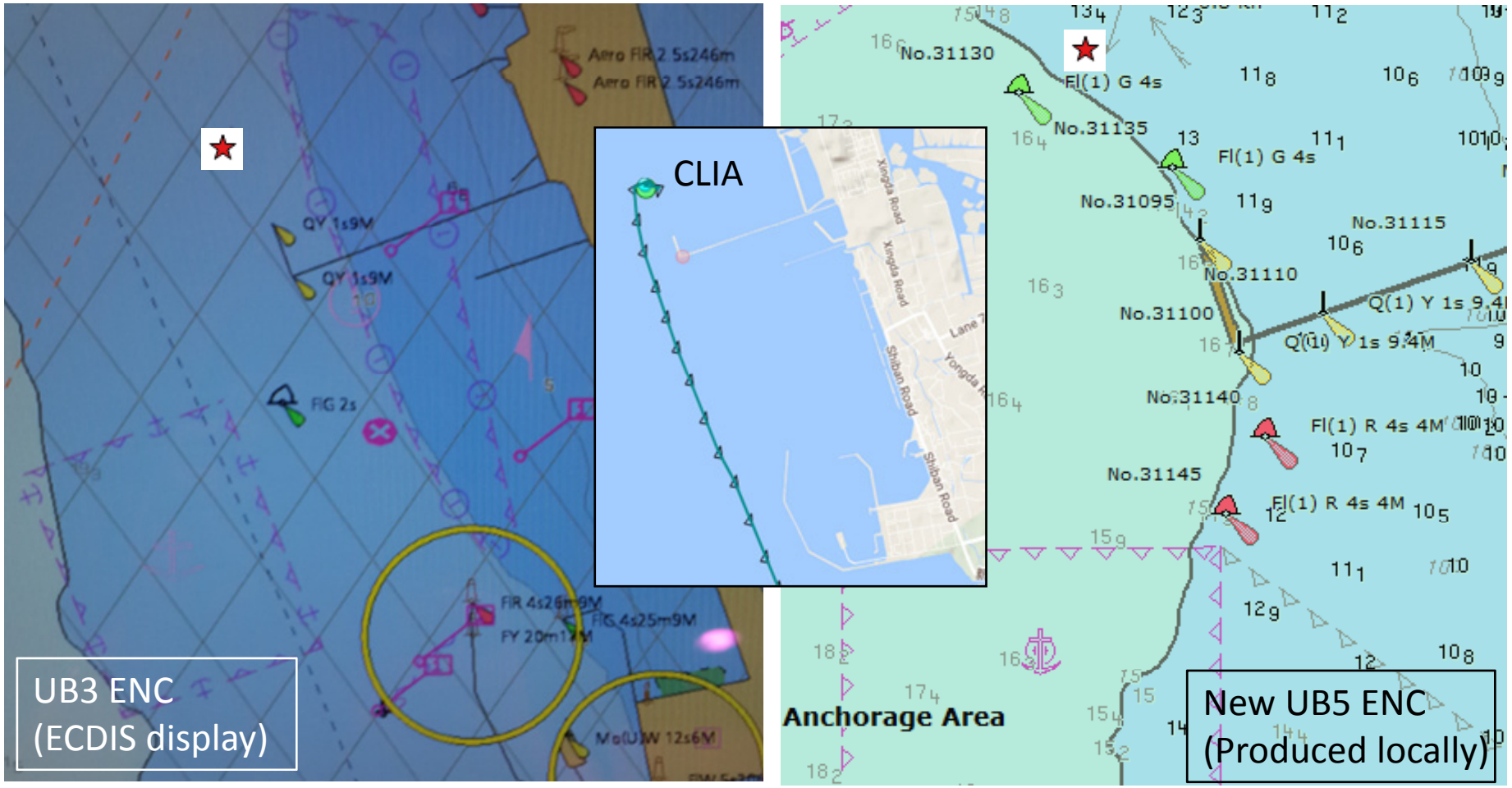




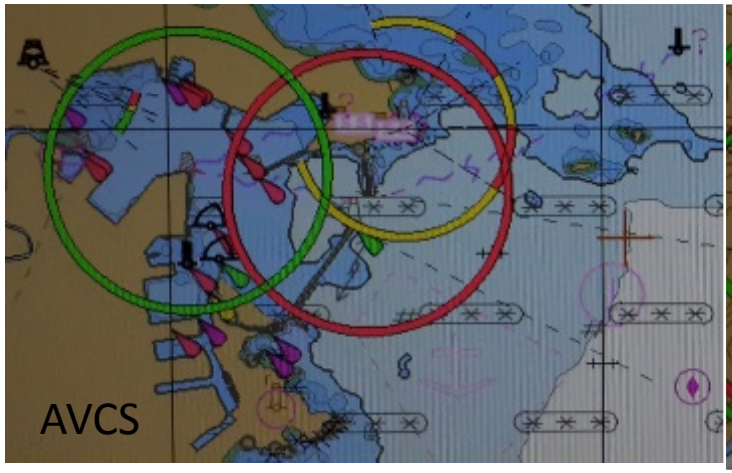
1:50,000 local paper chart (Ed3.2006)

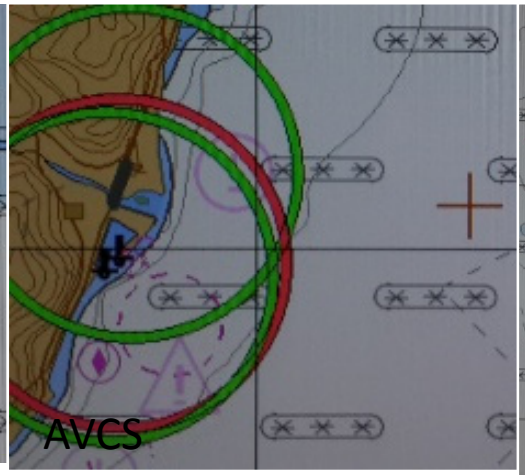
Recent grounding near Yung-An

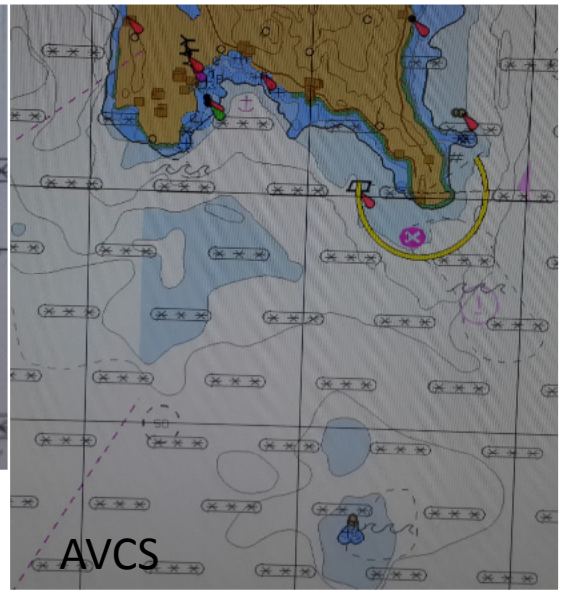
- CLIA (max. draught 14.9m) ran aground on 14 August, 2017, transporting more than 80,000 tons of coal to Taiwan Power's Xingda power plant.



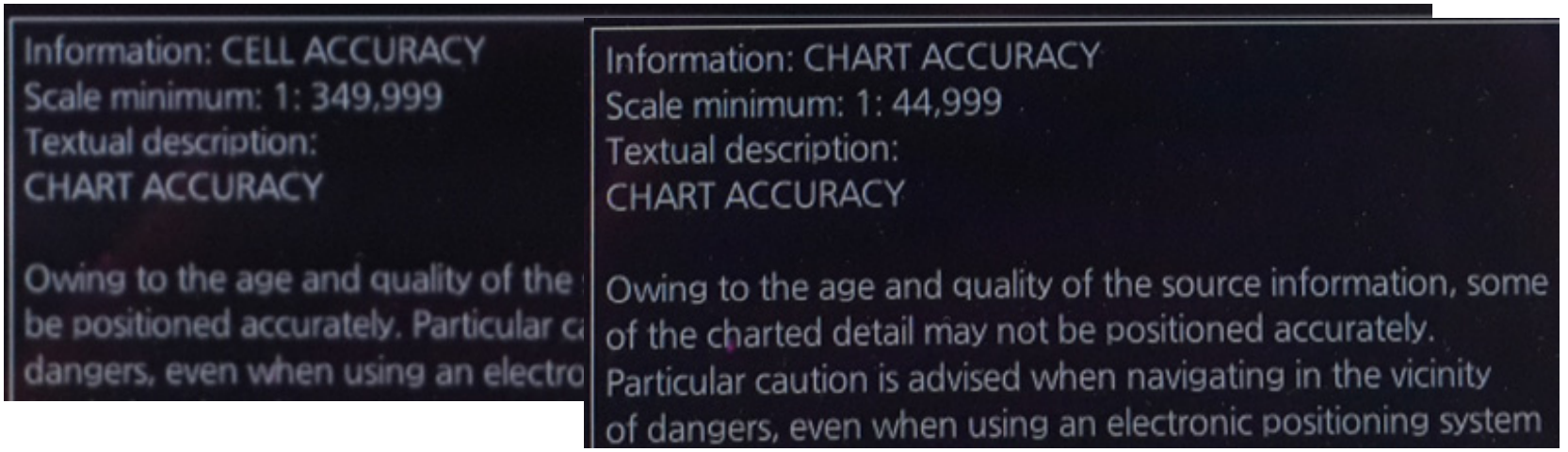
ENC status– East & South Coast







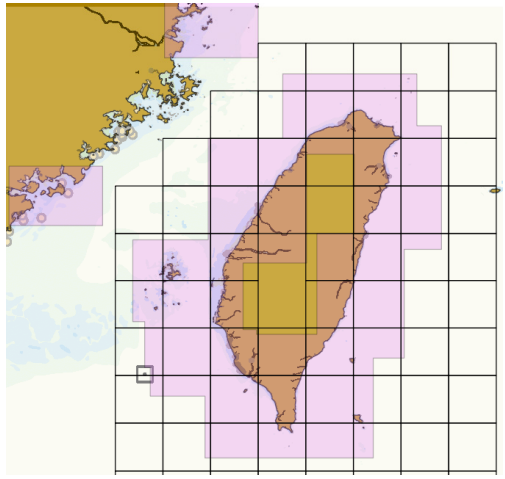
- UB3 Caution Area : Cell Accuracy
- UB5 Caution Area : Chart Accuracy & Nav. Marks



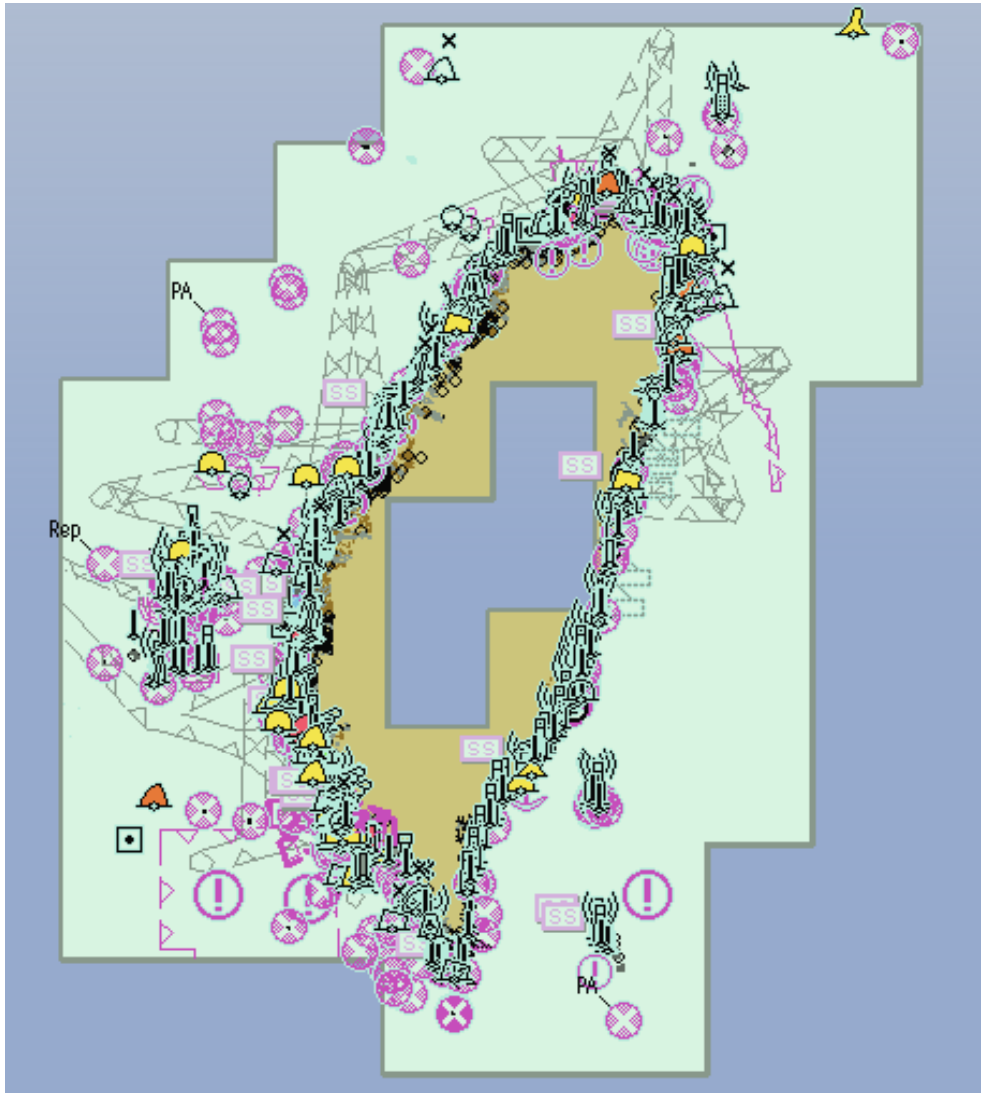
New ENCs produced
- being updated with newly collected data

- UB3 : 17 cells
- UB4: 56 cells (30’ ×30’)
- UB5: 20 cells

  +Yung An LNG port
- UB6: 7 cells

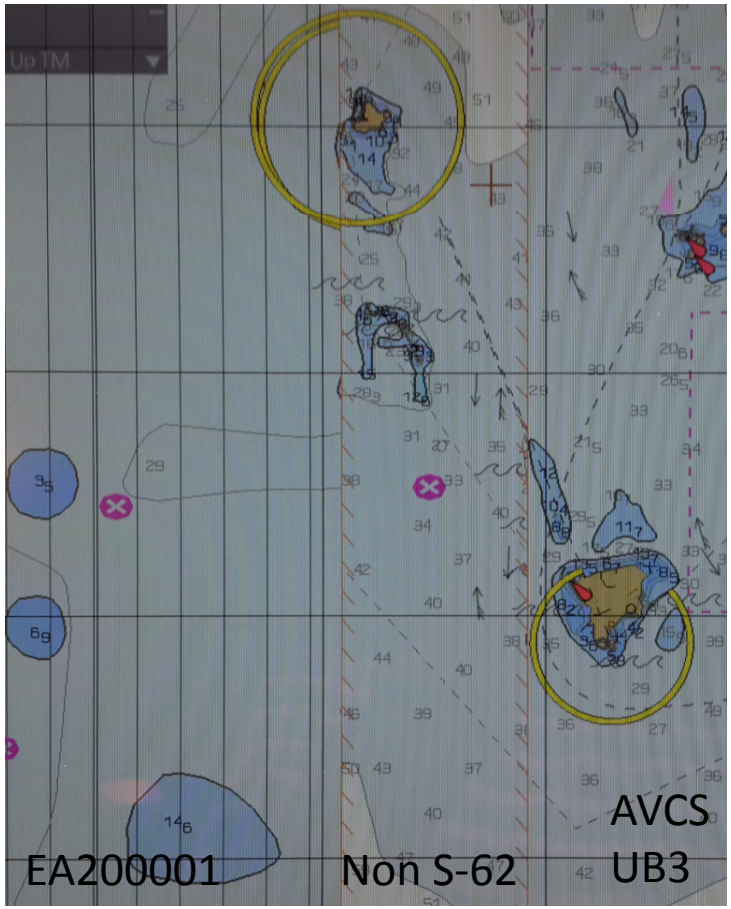


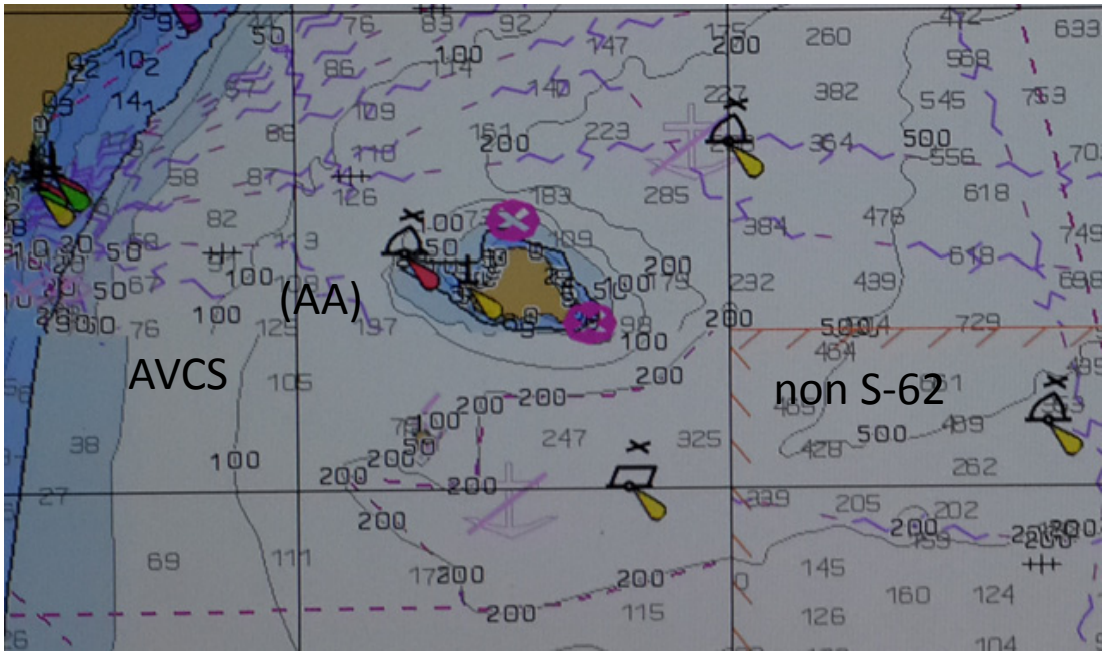
+ Dongsha island in SCS



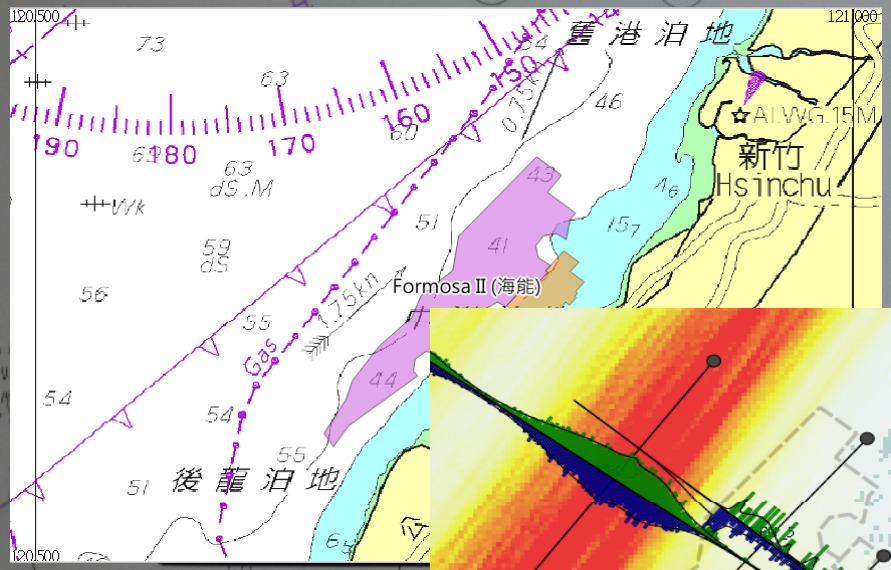
Test in a Type-Approved ECDIS

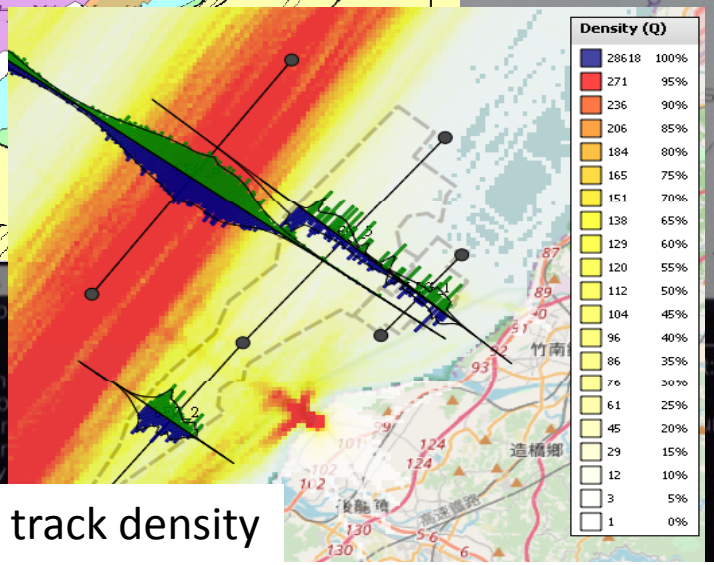
- Local ENCs show up only in gap areas or UBs, unless with a proper S-62 official producer code, such as AA





Vessel traffic is about to shift towards (ENC) areas of unreliable soundings





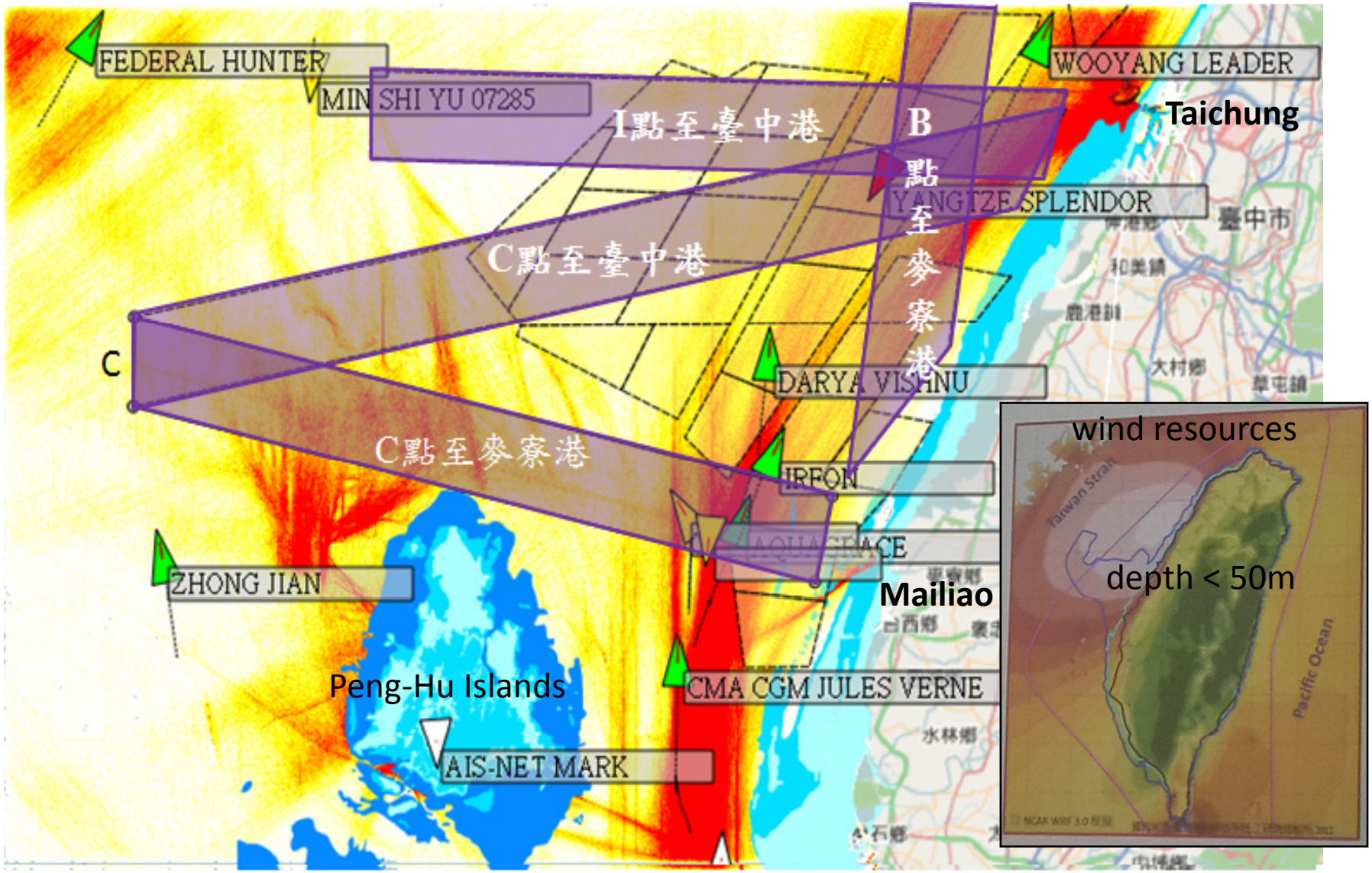
AIS track density

Formosa I & II Offshore OWF

Miao-Li

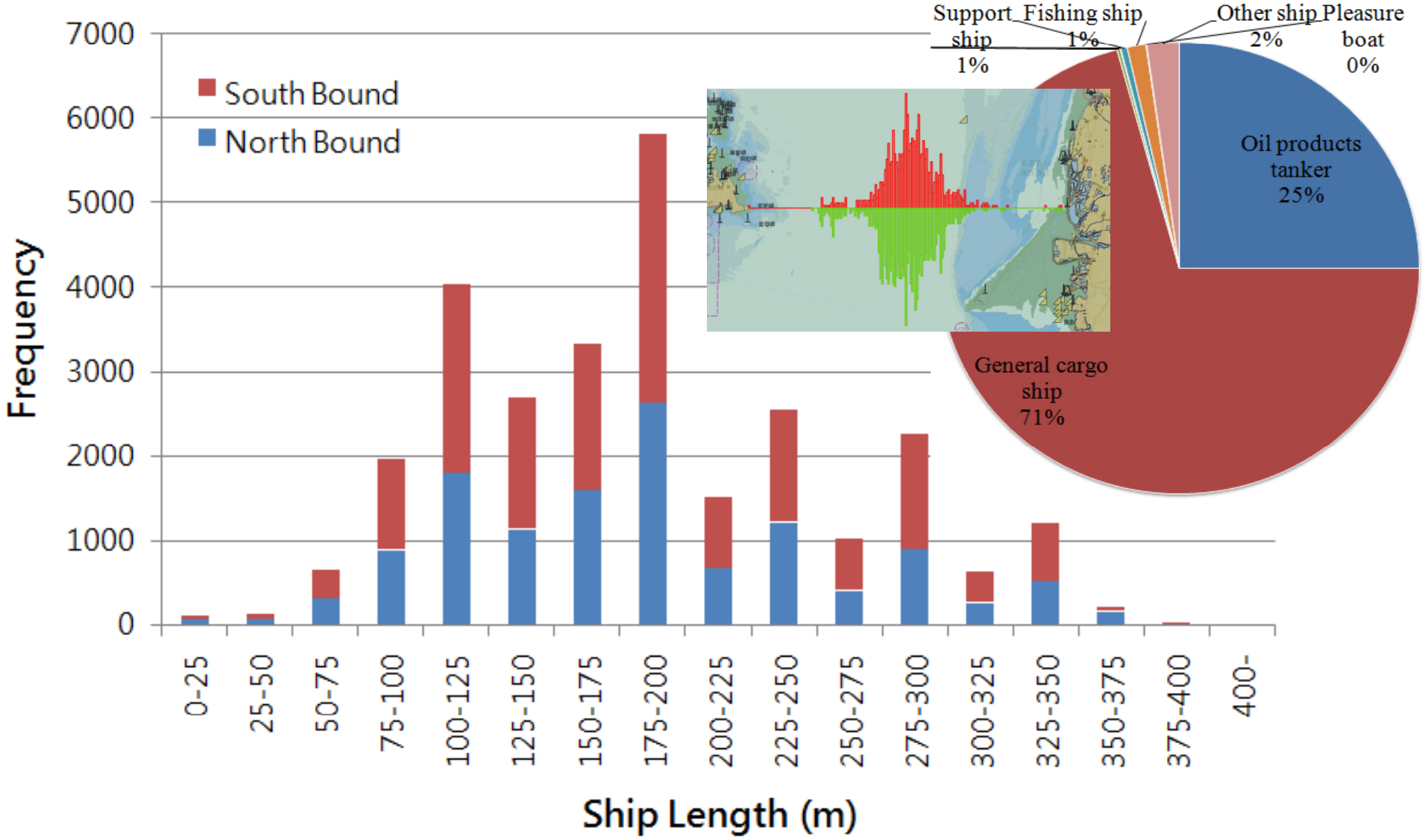
The Most Challenging Area

coexistence of shipping, fishing & offshore wind farms



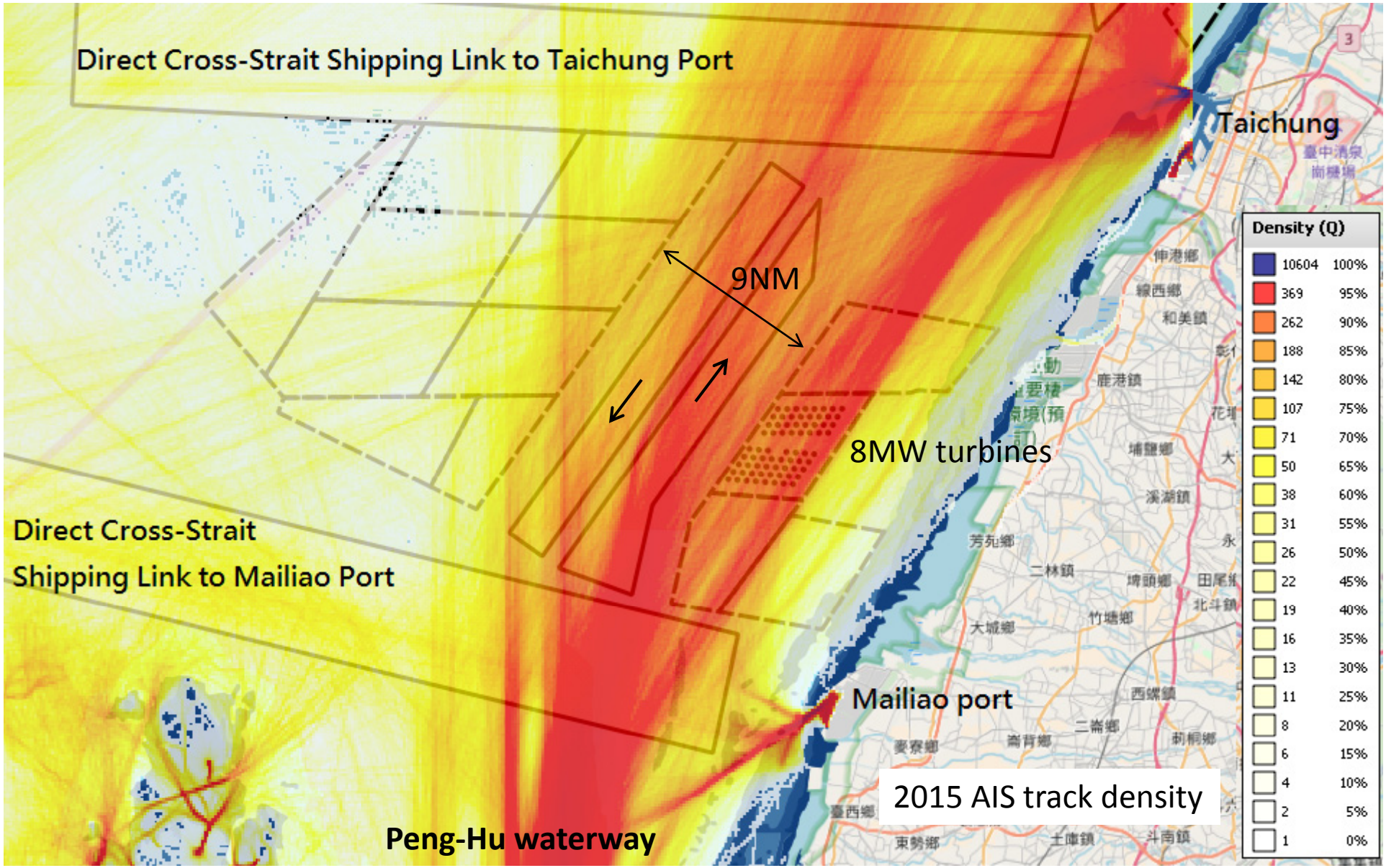
Vessel Traffic through Peng-Hu Waterway

> 70 vessel trips/day, 71% Cargo, 25% Tankers



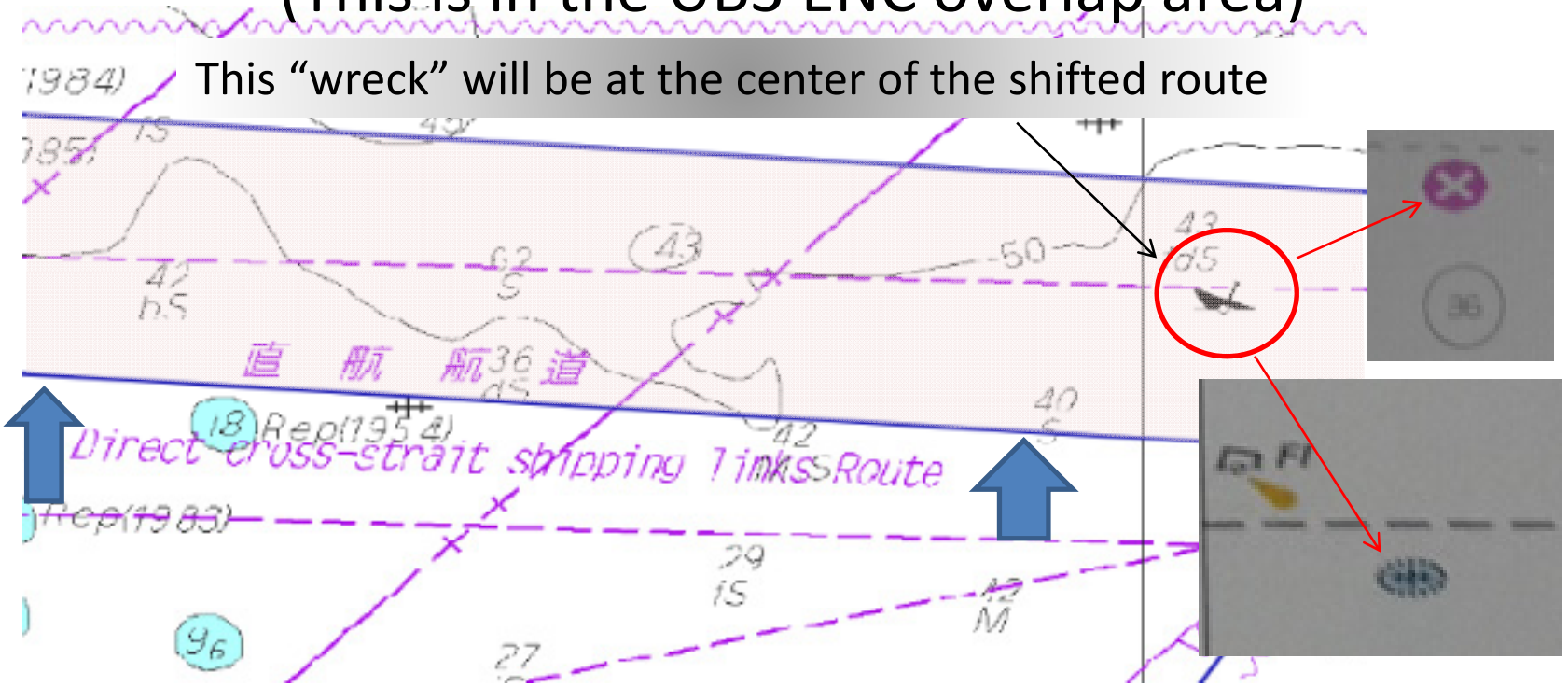
Require Major Reorganization of the Traffic

Target : offshore wind power 520MW by 2020, 3GW by 2025

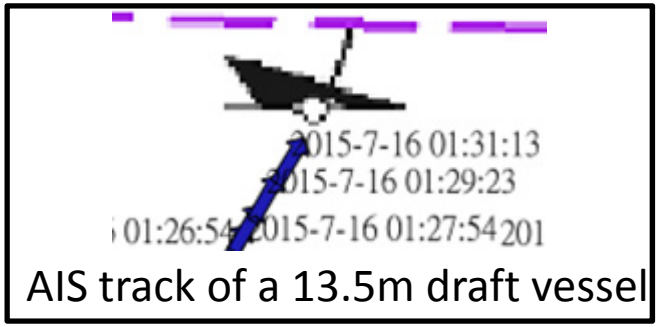


Is there a dangerous wreck ?

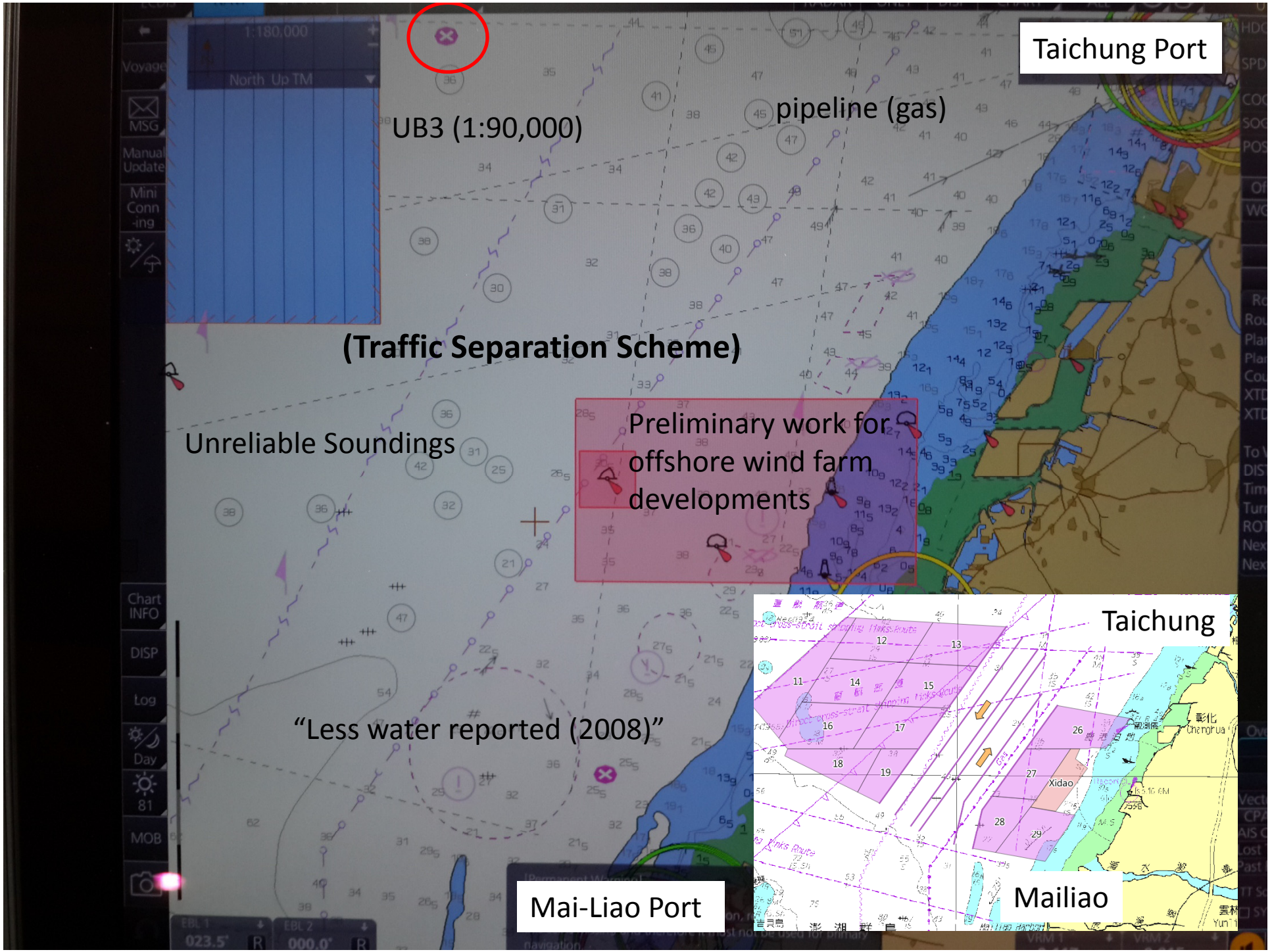
(This is in the UB3 ENC overlap area)



- Charted differently by the producers, with inconsistency also in different usage bands
  - dangerous wreck / always under water
  - wreck / covers & uncovers
- Hydro. survey found no features there !



AIS track of a 13.5m draft vessel


Taichung Port
UB3 (1:90,000)
pipeline (gas)
(Traffic Separation Scheme)
Unreliable Soundings
Preliminary work for offshore wind farm developments
"Less water reported (2008)"
Taichung
Mailiao
Mai-Liao Port

How do we manage the change & risk ?

- How to implement this mandatory TSS ?
- How to disseminate the MSI, NtMs, and ENC updating during the construction phase of the 14+ OWFs in this area ?
  - Safety zones, markings, submarine power cables crossing TSS
    - In WWNWS, the only way for us to send MSI is coastal radio (NAVTEX)
    - NtMs can take very long time (months) to reach mariners from local source to other chart producers, and may be interpreted wrongly.
- Need a fully functioning hydrographic service
  - To provide a better ENC coverage which is accurate, updated and easily accessible, to both SOLAS and non-SOLAS vessels, as well as the shore-side users.

Actions to be considered by WENDWG

- Note the IALA MBS in and around this area
  - Boundary in UB2, encoding in UB3/4/5/6
- Incorporate data from this area to WEND in the way ECDIS technology is depending on to enhance navigation safety and efficiency
  - Official S-62 code, RENC distribution, ENC scheme
- Facilitate the enhancement of hydrographic service for this area
  - Cooperation and communication
  - Participation in IHO and regional activities