

# Visualization of Quality of Bathymetric Data

Australia Testcase

IHO Data Quality Working Group



# ENC S-57 chart AU411142

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- Grid extents: 11-00-00 S, 142-00-00 E, 10-00-00 S, 143-00-00 E
- Cell size (approx.): 60 x 60 nm
- Compilation Scale: 90000
- Area: Australia – Queensland – Torres Strait
- Intended Usage: 4
- Issue Date: 20190108
- Number of Meta records: 98



# Number of Meta Objects

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- M\_COVR = 1 (*CATCOV = coverage available*)
- M\_CSCL = 6 (*45000, 22000, 18000*)
- M\_NSYS = 5 (*IALA A, ORIENT: 94.18, 112.3, 223, 256*)
- M\_QUAL = 87



# M\_QUAL attributes

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- CATZOC = U -> 0 objects
  - CATZOC = D -> 4 objects
  - CATZOC = C -> 22 objects
  - CATZOC = B -> 33 objects
  - CATZOC = A2 -> 15 objects
  - CATZOC = A1 -> 13 objects
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- For all M\_QUAL objects, only the attribute CATZOC has been used. All other attributes are void.



# Number of objects hazardous to navigation

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- OBSTRN = 98
- UWTROC = 236
- WRECKS = 25
- TOTAL = 359



# OBSTRNs related to CATZOC

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- CATZOC D:           0 point objects,           8 area objects
  - CATZOC C:           0 point objects,           38 area objects
  - CATZOC B:           1 point object,           29 area objects
  - CATZOC A2:          1 point object,           7 area objects
  - CATZOC A1:          1 point object,           2 area objects
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- CATOBS = foul ground for almost all OBSTRN (*area objects*)



# UWTROCs related to CATZOC

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- CATZOC D: 36 point objects
- CATZOC C: 93 point objects
- CATZOC B: 81 point objects
- CATZOC A2: 21 point objects
- CATZOC A1: 5 point objects



# WRECKS related to CATZOC

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- CATZOC D: 3 point objects
- CATZOC C: 9 point objects
- CATZOC B: 9 point objects
- CATZOC A2: 2 point objects
- CATZOC A1: 2 point objects





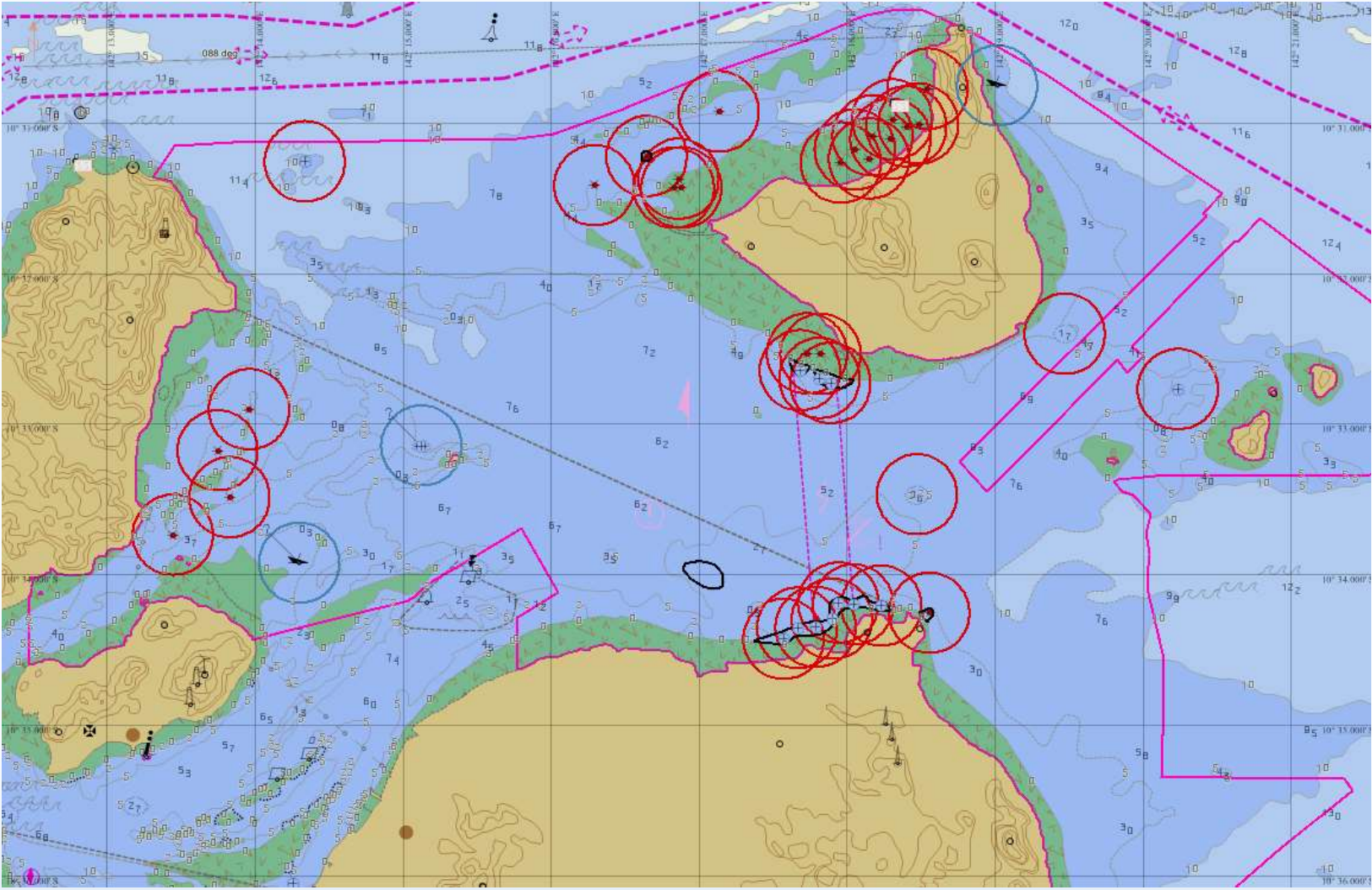
# Visual results of applying horizontal uncertainties

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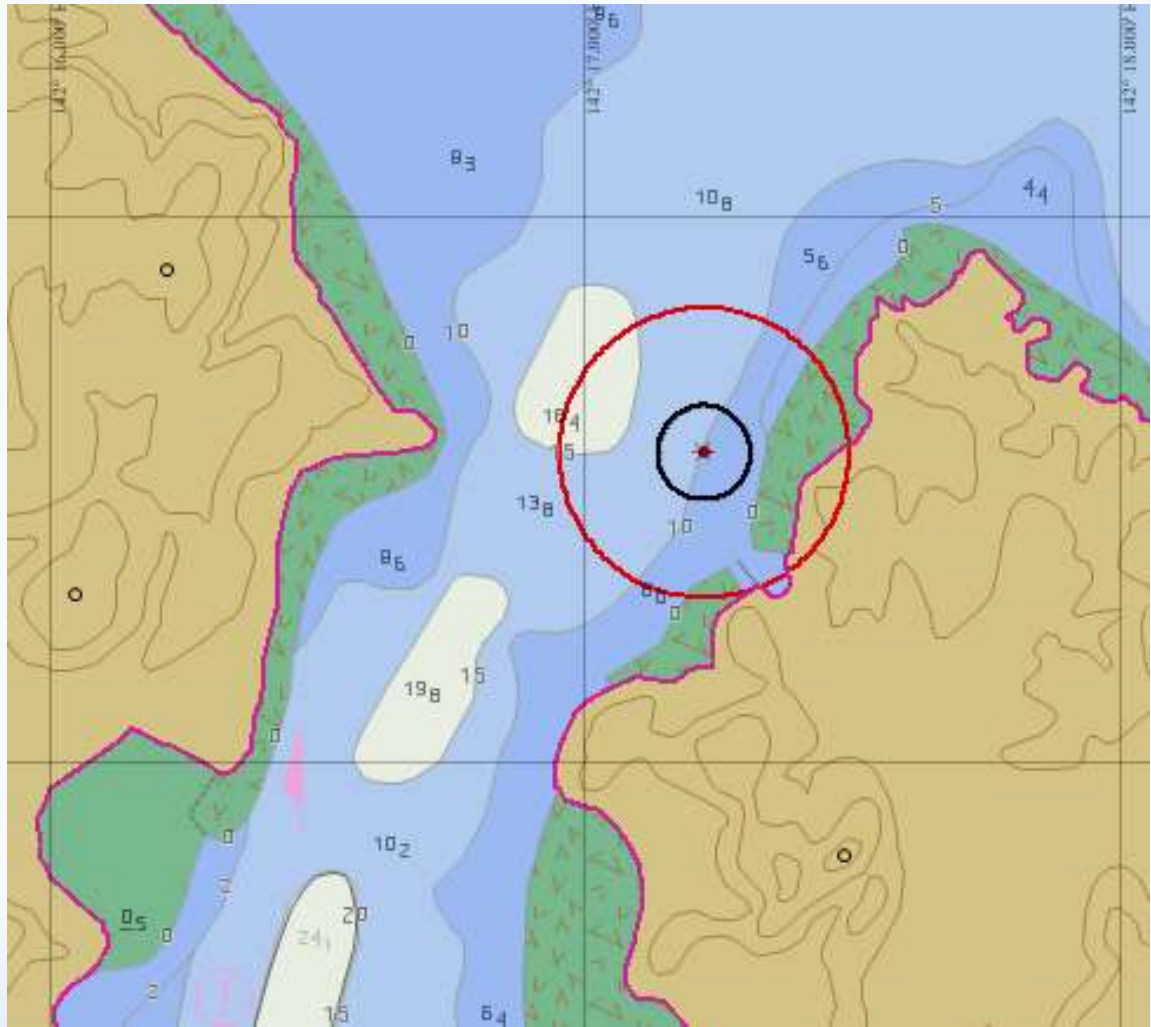
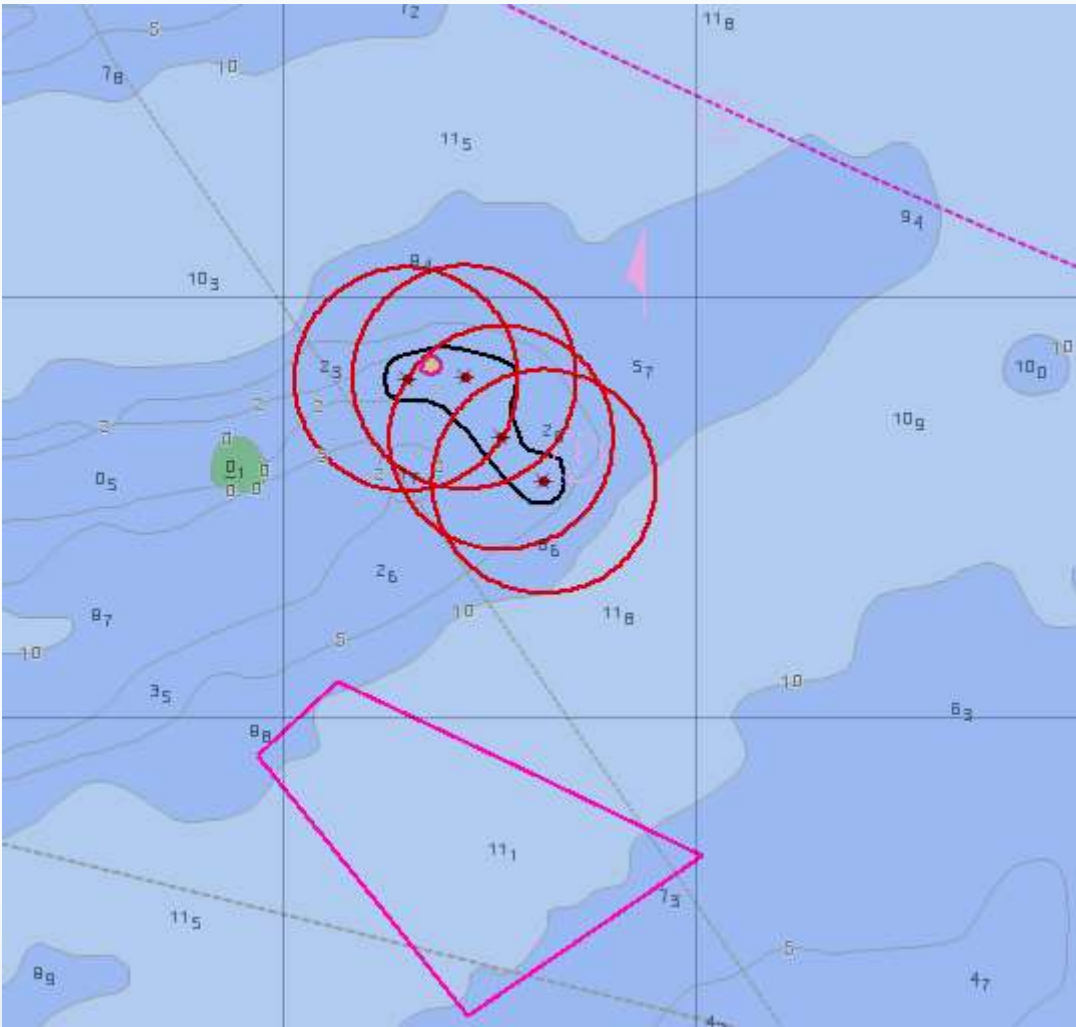
- For point objects UWTRC, circles are drawn in red.
- For point objects WRECKS, circles are drawn in blue.
- For area object OBSTRN, boundary is drawn in black
- For area object M\_QUAL/CATZOC, area is drawn in magenta
- Point object inside CATZOC = D -> radius of 500m
- Point object inside CATZOC = C -> radius of 500m
- Point object inside CATZOC = B -> radius of 50m
- Point object inside CATZOC = A2 -> radius of 20m
- Point objects inside CATZOC = A1 -> not done, as no ship will come closer than 20m to these objects.



# CATZOC D - example



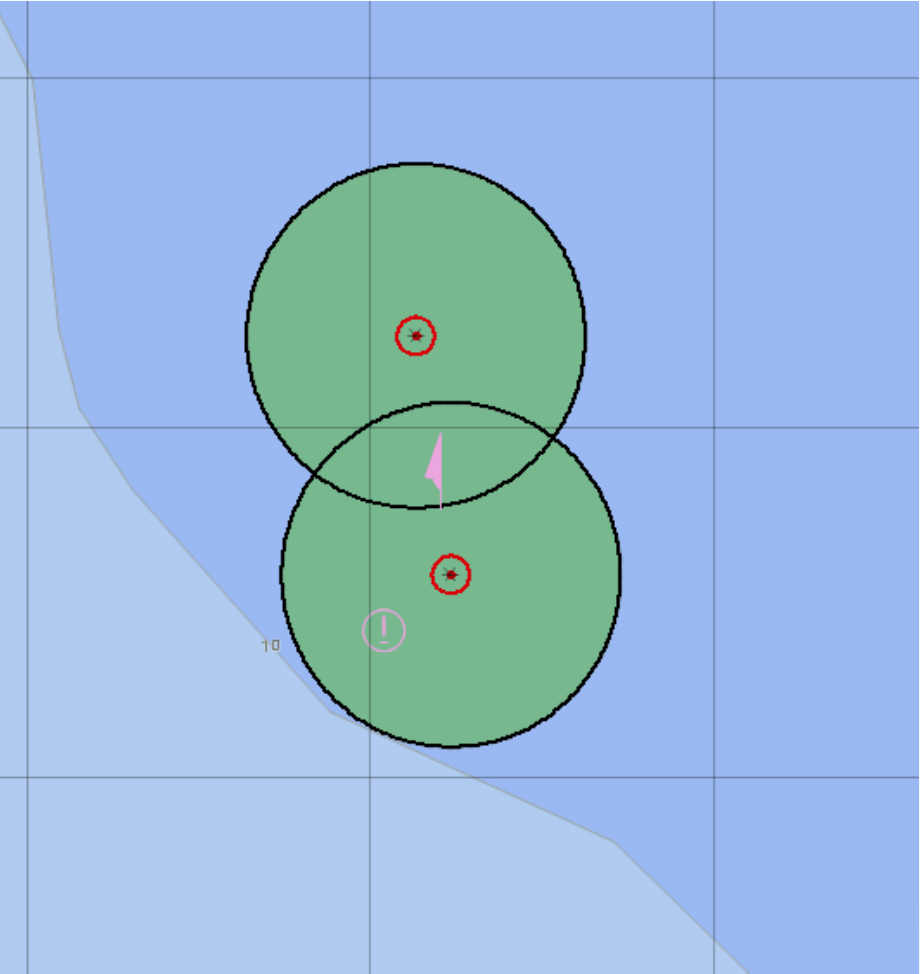
# CATZOC C – obstrn area < 500 circle of uwtroc



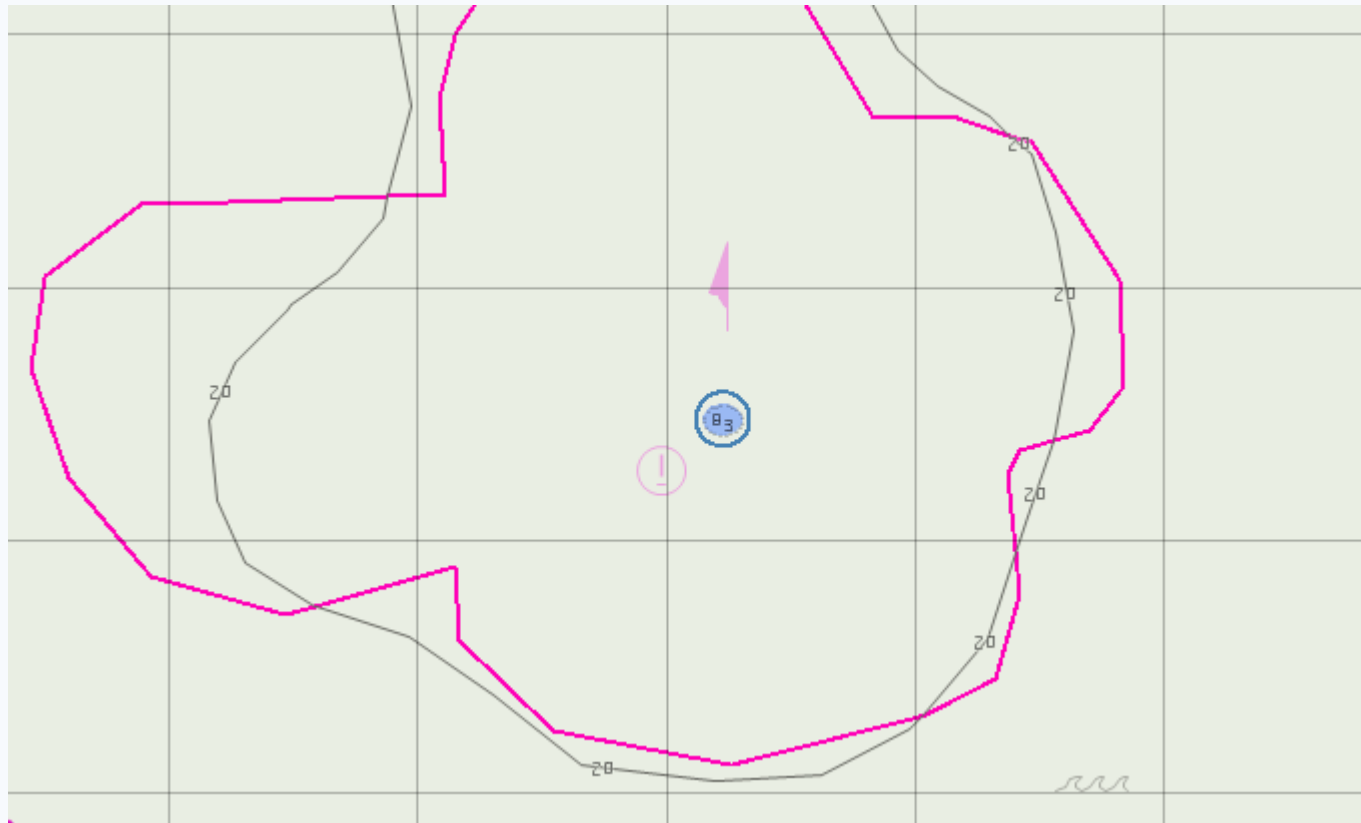
# CATZOC B – standard view (left), 50m radius (right)



# CATZOC A2 – OBSTRN area around two UWTROCs



# CATZOC A2 – wreck RMS Quetta



View scale: 1:5000

Pick Report

- AU411142.000
  - Quality of data
    - Category of zone of confidence in data: zone of confidence A2
  - Compilation scale of data
    - Compilation scale: 45000
  - Navigational system of marks
    - Marks navigational - System of: IALA A
  - Coverage
    - Category of coverage: coverage
  - Depth area
    - Depth range value 1: 19.70
    - Depth range value 2: 20.00
  - Wreck
    - Exposition of sounding: shoaler than range of depth of the surrounding depth area
    - Object name: RMS Quetta
    - Quality of sounding measurement: least depth known
    - Scale minimum: 179999
    - Status: historic
    - Textual description: AU007\_03.TXT
    - Value of sounding: 8.30
    - Water level effect: always under water/submerged
  - Administration Area (Named)
    - Jurisdiction: national
    - Object name: Torres Strait Compulsory Pilotage - Area B
    - Scale minimum: 2999999
    - Textual description: AU630\_02.TXT
  - Administration Area (Named)
    - Jurisdiction: national
    - Object name: Ship Reporting System
    - Scale minimum: 6000000
    - Textual description: AU069\_07.TXT
  - Administration Area (Named)
    - Jurisdiction: international
    - Nationality: AU
    - Object name: Torres Strait Quarantine Zone
    - Scale minimum: 1499999
  - Sea area/named water area
    - Object name: Coral Sea
    - Scale minimum: 6000000
  - Caution area
    - Information: Tidal Streams and Currents
    - Scale minimum: 699999
    - Textual description: AU659\_01.TXT
  - Magnetic variation
    - Reference year for magnetic variation: 2015
    - Scale minimum: 349999
    - Value of annual change in magnetic variation: -2.6
    - Value of magnetic variation: 5.1



# Observations

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- AHO has placed OBSTRN area (foul ground) around UWTROCs if DEPARE > 5m
- For CATZOC = C and D, the area is smaller than the 500m uncertainty of point objects.
- For CATZOC = B, the area is bigger than the 50m uncertainty of point objects.
- For CATZOC = A2, the area is bigger than the 20m uncertainty of point objects.
- Single wreck is surrounded by CATZOC = A2, adjacent CATZOC = B.
- At view scale 1:7500, the 20 meter uncertainty circle around the wreck has the same size as the ENC symbol for the wreck. The compilation scale of the area is 1: 45000
- If AHO would assign horizontal uncertainties to individual UWTROC, no need to create OBSTRN/foul ground anymore in S-101.



# Response from AHO

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- AHO created OBSTRN (areas) around existing UWTRC and OBSTRN point features.
- In response to ECDIS shortfall in regards to the way it interacts with point features.
- AHO created OBSTRN areas with a diameter equal to S-52's symbol ISODGR01 (7mm).
- The obstruction radius in meters was calculated by multiplying 3.5 by the compilation scale in the area (ENC or M\_CSCL).
- The AHO was not trying to solve any issues related to M\_QUAL position accuracy uncertainties.

