

DISCLAIMER

This verification report has been compiled by Indonesian and Dutch experts, between the 6th and 9th of February 2017, with the aim to get clarity about the wreck sites of the three Dutch Navy ships *Hr.Ms. De Ruyter*, *Hr.Ms. Java* and *Hr.Ms. Kortenaer*. In 2016, a tech-dive team claimed that the wrecks have disappeared from the seabed.

It was the first step in a set of agreements between the Netherlands and Indonesian government to investigate what may have happened to the sites, to learn from what has happened and - if indeed the sites are gone by salvaging - to develop ways to avoid this of ever happening again.

On the 13th of February 2017, right after the identification mission, Minister Bussemaker from the ministry of Education, Culture and Science signed a MoU (Memory of Understanding) to enhance the cooperation between the two countries. The MoU explicitly includes safeguarding Maritime Heritage. This will be the basis for further research on the sites as discussed in the verification report and other maritime sites that need joint protection and management as well.

This report has been drawn up during the meeting held in February in Jakarta and has therefore not been edited. The report has been accepted and agreed upon by all members of the expert group.

Joint Verification of the location and condition of Hr.Ms. De Ruyter, Java and Kortenaer

6 to 9th of February 2017, Jakarta Indonesia

Version 09/02/2017



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Introduction

Hr.Ms. *De Ruyter*, flagship of Rear Admiral Karel Doorman, Hr.Ms. *Java* and Hr.Ms. *Kortenaer* were torpedoed by the Imperial Japanese Navy during the Battle of the Java Sea that took place on the 27th of February 1942. As a result of this 915 men died. The defeat of this first battle on the 27th and smaller concessive engagements the days after meant not only the loss of the Battle by the American-British-Dutch-Australian Command (ABDACOM) but also the occupation of the Dutch Indies by the Japanese.

Until 2002 the locations of the lost ships were unknown. On the 1st of December that year, an Australian tech-dive team discovered what they believed were the light cruisers Hr.Ms. *De Ruyter* and Hr.Ms. *Java*. The approximately 170 m and 155 m long ships were identified on specific features and photographically recorded. Two years later (2004), they claimed to have found the 98 m long destroyer Hr.Ms. *Kortenaer* as well (see e.g. *Report – survey of naval wreck sites Java Sea 2016 14 nov 16, by Andrew Fock*).

The wrecks have not been officially reported to either the Netherlands or Indonesian authorities. For several years however the wrecks were subjected to technical (tourist) dive trips and commemoration visits on the sea surface. In 2008 the visiting of the two cruisers was recorded on film. The wrecks were lying well-preserved on the seabed. A small number of items was lifted from the wrecks in since their discovery. Four bells with the names of the *Java* and the *Ruyter* and other objects that found their way to an auction house in Australia, the Navy Museum in Den Helder and places like the War cemetery in Surabaya.

In 2016 another dive trip to the sites was organised by the Karel Doorman Foundation (KDF) that chartered the MV *Empress* in order to record the wrecks on film for the 75 years commemoration of the Battle of the Java Sea on the 27th of February 2017. During that trip it was noted that on the same positions they had dived earlier, no wrecks were present of what they had identified as the *De Ruyter* and *Java*. Only large trenches and some metal pieces of shipwrecks were discovered in the area. On the location of the supposed *Kortenaer* only a small fraction of the earlier discovered shipwreck parts remained on site.

The dive team came to the conclusion that the wrecks had been salvaged and reported this to the Karel Doorman Foundation in the Netherlands which notified the Dutch authorities. The Dutch authorities discussed the reported missing of the wrecks with the Indonesian authorities. None of the wrecks had been officially reported to the Dutch and the Indonesian authorities. Information was gathered and recorded by a third party and none of this data was previously available to the two governments. It was therefore decided that a joint research team of Netherlands and Indonesian government experts would evaluate the available data. They were asked to draw their conclusion to the claim made by the dive team that indeed three wrecks had been salvaged and that these three wrecks were the remnants of the Dutch warships *De Ruyter*, *Java* and *Kortenaer*.

Before coming to any conclusions the supposed wreck of Hr.Ms. *De Ruyter* will be referred to as Site A, that of the Hr.Ms. *Java* as Site B and the location of Hr.Ms. *Kortenaer* as Site C.

Aim of verification mission

In short, the aim of the first stage gathering of experts on the 6th to the 9th of February 2017 is to get clarity about the identification of the wrecks as Hr.Ms. *de Ruyter*, Hr.Ms. *Java* and Hr.Ms. *Kortenaer* and the status of the wrecks (location, condition).

The expert team conducted a joint verification related to the status of shipwrecks sites A, B, C that included literature study and analysis on hydrography, oceanography, and archaeology. The joint verification included experts of relevant fields including hydrography, archaeology and cultural heritage management from both governments.

Expert Group

The expert group that jointly verified the data and drew up this report consists of:

- Letkol Laut (P) Oke Dwiyana, S.T., M.M., Center for Hydrography and Oceanography Indonesian Navy,
- Mayor Laut (E) Janjan Rechar, S.T., Center for Hydrography and Oceanography Indonesian Navy,
- Zainab Tahir, Directorate of Marine Service Ministry of Marine Affairs and Fisheries,
- Drs. Bambang Budi Utomo, Center for National Archaeological Research Ministry of Education and Culture,
- Shinatria Adhityatama, Center for National Archaeological Research Ministry of Education and Culture,
- Abi Kusno, M.Sc., Directorate of Cultural Property Preservation and Museum Ministry of Education and Culture,
- Commander W.A. (Toine) Barten, Head of Military Hydrography, oceanography and meteorology of the Royal Netherlands Navy,
- Drs. M.R. Martijn Manders, Head of Maritime Heritage Programme of the Cultural Heritage Agency of the Netherlands, Ministry of Education, Culture and Science,
- Robert de Hoop, Member of the Maritime Heritage Programme of the Cultural Heritage Agency of the Netherlands, Ministry of Education, Culture and Science.

Scope and Limitation

The scope of this joint verification meeting was limited to sites A, B and C in relation to the three Dutch ships *De Ruyter*, *Java* and *Kortenaer*. Within 3 days, a joint report has been compiled about data gathered by third (non-governmental) parties. The raw Multibeam (MBES) data only arrived on the 7th of February. This MBES data was not according to the IHO S44 standards. Also, no bathymetric data was available to the team from the period before 2016. Therefore, the current data cannot be compared. Pictures and films were made over many years by different people, which made them also not always easy to compare. After the expedition in 2016 no additional data was collected by any party on site to verify the claim of the divers.

Available data

Primary data of the three sites used for this verification mission was recorded by third parties, all related to tech-dive trips offered by the MV *Empress*. Historical data is assembled using secondary sources like books and articles related to this topic. Raw Multibeam data has been analysed by the hydrographic offices in the Netherlands and Indonesia.

The third party data from the dive team *MV Empress* that was used:

- Report – Survey of Dutch Naval Wreck Sites Java Sea 2016 (digital), by dive team *MV Empress*.
- Preliminary report into Multibeam investigations of warships sunk during the battle of the Java Sea (digital), by dive team *MV Empress*.
- Raw Multibeam files (arrived on the 7th of February 2017) of the three wrecks from the 2016 expedition, by dive team *MV Empress*.
- Photos of 2002 expedition of the Sites A and B, by dive team *MV Empress*.
- Video – expedition 2008 by dive team *MV Empress* of the sites A and B.
- Photos from internet of a visit by the *MV Empress* at site A in 2009.
- Video expedition – 2016 dive team *MV Empress* of Site A, B and C.
- Objects retrieved from the sites by the *MV Empress* dive team

Other data that was used:

- Historical data from literature studies.
- Informal analyses (email) of the Multibeam picture data from the preliminary Multibeam report made by the expedition in 2016, by the Hydrographic Office in the Netherlands.
- Processed MBES data from Netherlands and Indonesian Hydrographic Office.

Verification of data

The above data has been analysed on accuracy, reliability and relevancy. After this the compiled data was used to deduct the probability of each individual site being at the position that it was claimed to be at, the probability the sites could be linked to either the *Hr.Ms. de Ruyter*, *Hr.Ms. Java* and *Hr.Ms. Kortenaer* and to give an indication of the current condition (2016) of the individual sites.

The coordinates/locations of the wrecks

The wrecks at site A and B were discovered during an Australian expedition in December 2002 by tech divers from the *MV Empress*, including Kevin Denlay and charter boat captain Vidar Skogli. They identified them as the *Hr.Ms. De Ruyter* (Site A) and *Hr.Ms. Java* (Site B). Two years later, members of the same team discovered wreck site C on 12 August 2004 and identified her as the *Kortenaer* on 5 November 2004.

Coordinates below were given by the discoverers of the three shipwrecks and from the Karel Doorman Foundation report of the expedition that took place in November 2016.

The coordinates underneath are all in WGS 84 (World Geodetic System 1984). The accuracy of these coordinates is estimated to be +/- 10 meters (horizontal).¹

¹ Correspondence Raymon van de Veen, Hydrographic Office Netherlands.

1. Site A

Site A was located by Mr. Vidar Skogli (charter boat captain of MV *Empress*) and a team of tech divers in 2002. The position recorded at that time was:

6° X.XX' S

112° X.XX' E

At a depth of approximately 68 meters.

In November 2016 a large trench, laying SE to NW, was located in the seabed with a small disturbed area immediately adjacent to this hole. The position recorded was:

6° X.XXXX' S

112° X.XXXX' E

At a depth of approximately 70 meters.

2. Site B

Site B was located by Mr. Vidar Skogli and a team of tech divers in 2002. The position recorded at that time was:

6° X.XX' S

112° X.XX' E

At a depth of approximately 68 meters.

In November 2016 a 'ship shaped' trench, laying approximately N to S, was located in the seabed. The position recorded was:

6° X.XXXX' S

112° X.XXXX' E

At a depth of approximately 70 meters.

A second smaller trench was located some 200m away to the SE consistent with the previously known position of the stern.

3. Site C

Site C was located by Mr. Vidar Skogli and a team of tech divers in 2004. It was broken in two pieces, which were at that time about 20 meters apart. Both pieces are upside down. The position recorded at that time was:

6° XX.XX' S

112° X.XX' E

At a depth of approximately 45-52 meters.

In November 2016 some remaining wreckage of site C, laying approximately N to S (to front), was located. The position recorded was:

6° XX.XXXX' S

112° X.XXXX' E

At a depth of approximately 50 meters.

Historical positions

In the historical data, several indications and even 'exact' positions are given for the three ships at time of sinking (See also Appendix 2). We have to keep in mind however that these positions were taken during a battle, in the middle of the night and without equipment now used as a standard for positioning. Also, after being hit, (parts of) the ships stayed afloat before disappearing fully underwater. We do not know when these contemporary positions were taken and how much the wreck parts have moved from position afterwards.

Helfrich 1950: Position *Java*: 6 degrees 11 minutes S and 112 degrees 8 minutes E. (Time 27 February 23:30h).²

Bezemer 1987: Hr.Ms. *Kruisers De Ruyter* and *Java* sank at approximately 6 degrees 11' S – 112 degrees 8' E.L. in the Java-Sea, widely 60 kilometres S.W. of Bawean.³

Bosscher 1986: The Captain of the HMAS Perth, Captain at Sea H.M.L. Waller, signalled approximately at 1: 00 AM: 'Returning to Batavia'. *De Ruyter* and *Java* both disabled by heavy explosions in position 006 degrees south 112 degrees east.⁴

Nater 1980: Both cruisers are lying on the bottom of the Java Sea approximately 60 km SW of the island Bawean, more precise at 06 degrees 00 S 112 Degrees 05' E.⁵

² Helfrich 1950, 422

³ Bezemer 1987, 342

⁴ Bosscher 1986, 291-292

⁵ Nater 1980, 73-75

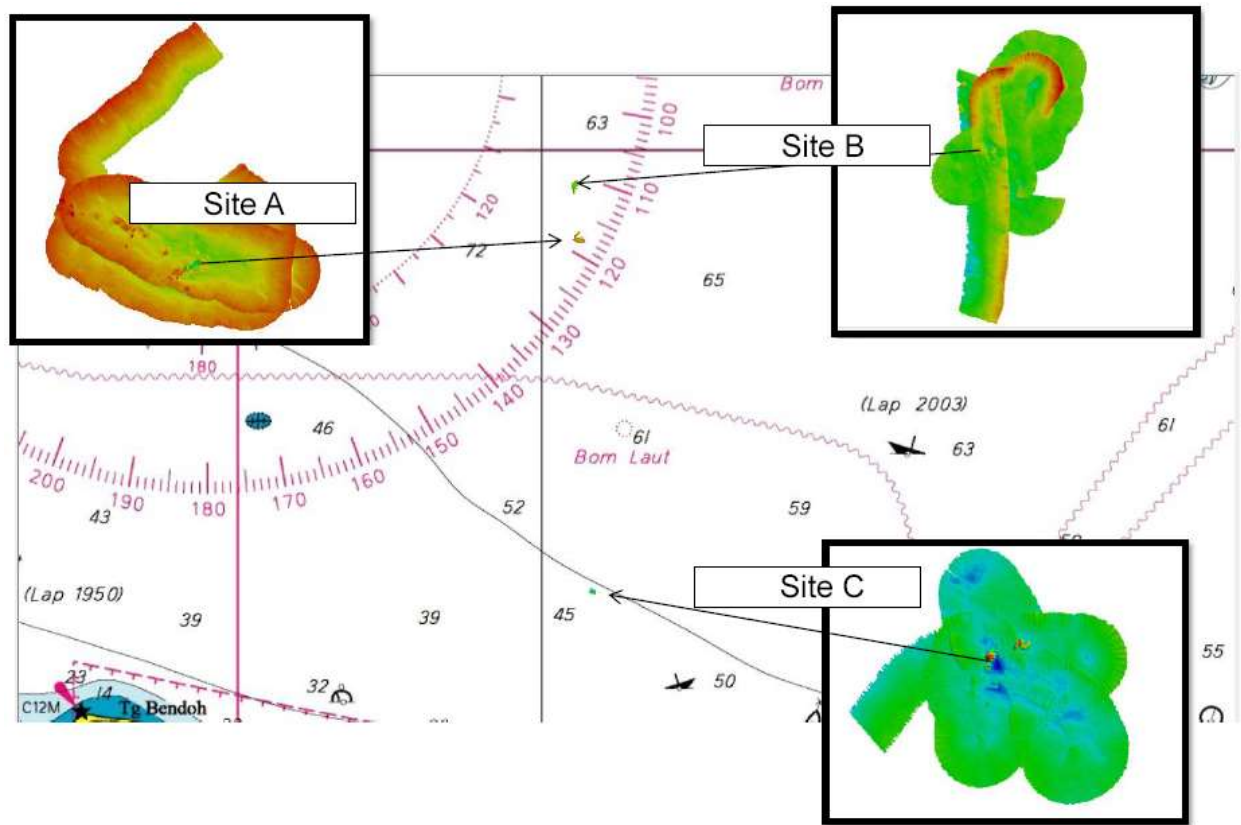


Figure 1: Survey locations.

These positions correspond with the many sketches depicting the strategy and movements of the ships that were drawn up after the battle.

A more detailed visual account of the battle can be found in Appendix 2.

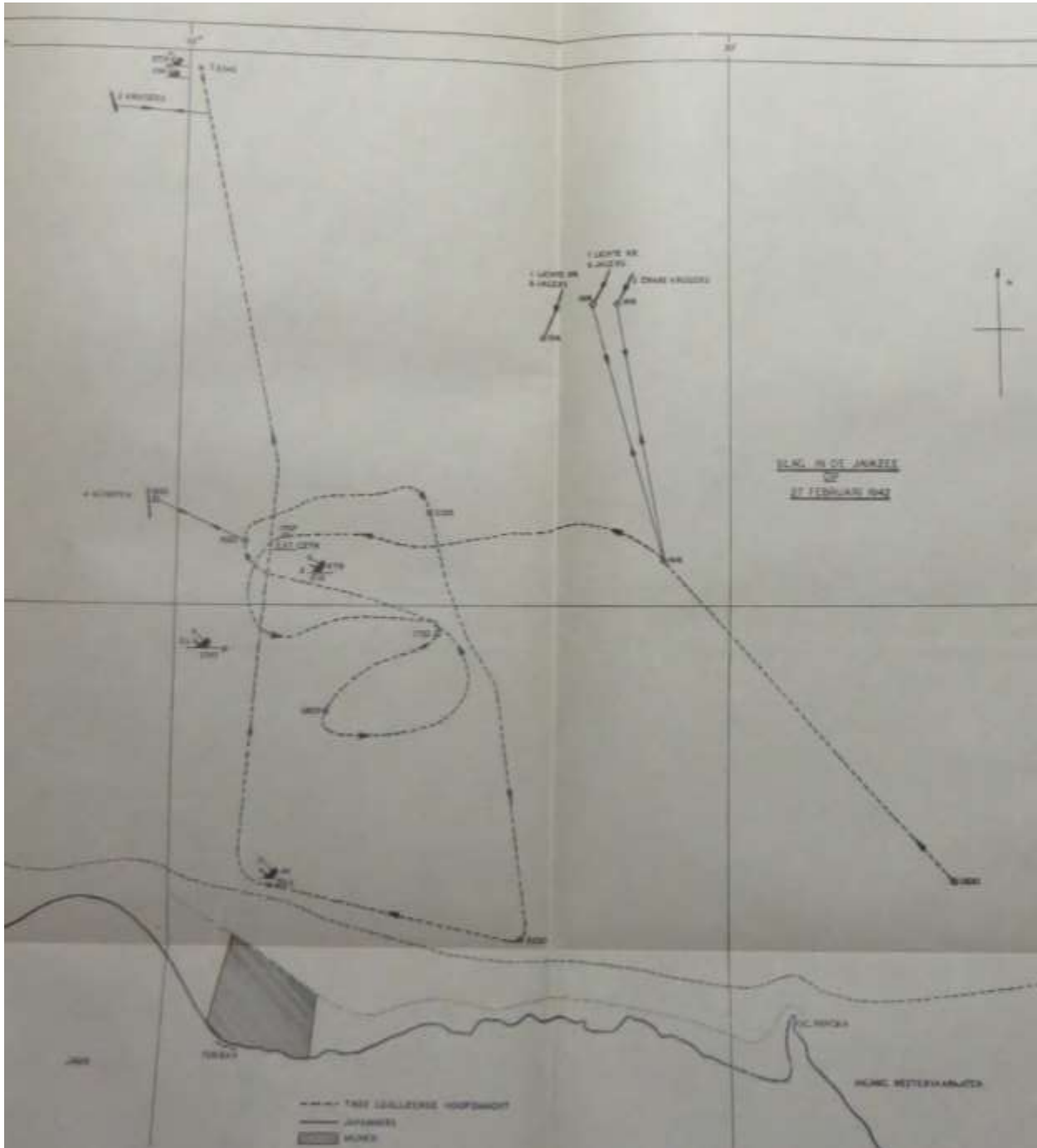


Figure 2: A sketch depicting the movement of the ships during the Battle of the Java Sea. From Kroese 1944.

The descriptions and positions shown on the historical maps show us that *De Ruyter* is situated slightly more North than the *Java*. The divers however claim they have found the wrecks the other way around. *De Ruyter* was turned already southwards when hit and floated for another three hours before sinking, while *Java* went down much quicker. The distance is also less than 4 nautical miles, a distance easy to bridge within the three hours period.⁶

Hydrographic data analyses

Hydrographic data has been available for this mission from:

- A: Report survey of naval wreck sites Java sea 2016 by The Karel Doorman Foundation.
- B: Preliminary report into Multibeam Echosounder (MBES) investigations of warships sunk during the battle of the Java sea, by The Karel Doorman Foundation.
- C: Indonesia Chart 81A (may 2013) based on source NED 70 edition 1950 (surveys between 1886-1918) and NED 66 edition 1950 (survey 1925).
- D: Raw data files from the WASSP33 MBES used in survey naval wreck sites Java sea 2016 by The Karel Doorman Foundation.

The Netherlands Hydrographic Branches and Indonesia Hydrographic and Oceanographic Center did not have any official hydrographic data regarding the wrecks available.

Hydrographic equipment used

For the Multibeam recording a WASSP33 multi-beam echo sounder (MBES) was used by the team of the MV *Empress*.

A multibeam echo sounder (MBES) system is normally used to measure depths and it can also be used to measure the depth differences of the bottom. It is possible to detect trenches or large wrecks/obstructions. For official survey's (IHO standard 44) side scan sonar (SSS) is used to detect wrecks and obstructions and not a multibeam echo sounder (MBES). The MBES (WASSP33) used for the wreck investigation during the survey of the naval wreck sites Java sea 2016 is not a very sophisticated system and has a low resolution. No patch test was conducted and the corrections for sound velocity were not applied and no tidal corrections were done. However, the used system in this configuration was adequate enough to find large wrecks and trenches. The used navigation system was also adequate.

Remarks:

1. *Multibeam echosounder (MBES) can be used for detection only, it is not possible to use MBES for identification. Identification is only possible with divers or Remote operated vehicles (ROV's).*
2. *The survey of the naval wreck sites Java sea 2016 does not reach the IHO standard S44 and the data cannot be used for official charting.*

⁶ What also needs to be mentioned is that Longitude is almost spot on for the wrecks in comparison between the historical data and the current find locations. The latitude is different and the other way around for the two wrecks. We need to keep in mind that south latitude is used in these waters while north latitude is used in the Netherlands. A mistake may have been made while publishing the maps of the battle.

Analyses of the available hydrographic data

The official hydrographic data from Indonesia Hydrographic and Oceanographic Center that was used here was the latest chart Java sea, published in May 2013. For the relevant wreck area the source is the NED chart 70 edition 1950 (surveys between 1886-1918). So there is no official hydrographic data of wrecks on sites A, B and C, the vicinity of the locations or Hr.Ms. *De Ruyter, Java* and *Kortenaer*.

Remark: Based on the (find) location of the wrecks stated in the Report survey of naval wreck sites Java sea 2016 the Indonesia Hydrographic Oceanographic Center is the charting authority.

Site A

The position of the trench on the Multibeam snapshot (figure 6) is in consistency with the position as stated as the find position (located 2002). The trench is around 170 metres long.

Based On Raw Data:

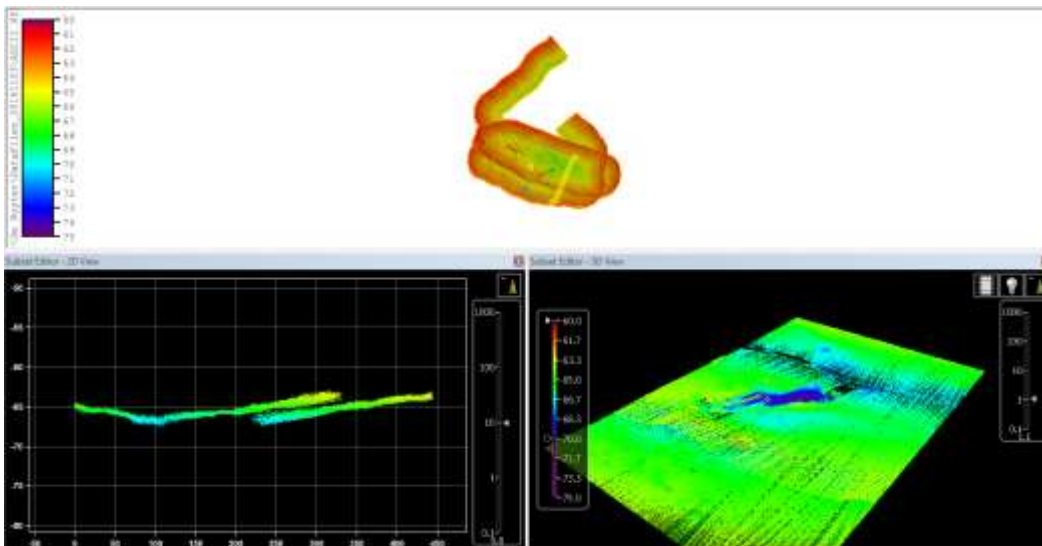


Figure 3: Examining MBES Data Surface Grid 1m bin, 3D and 2D Point Cloud.

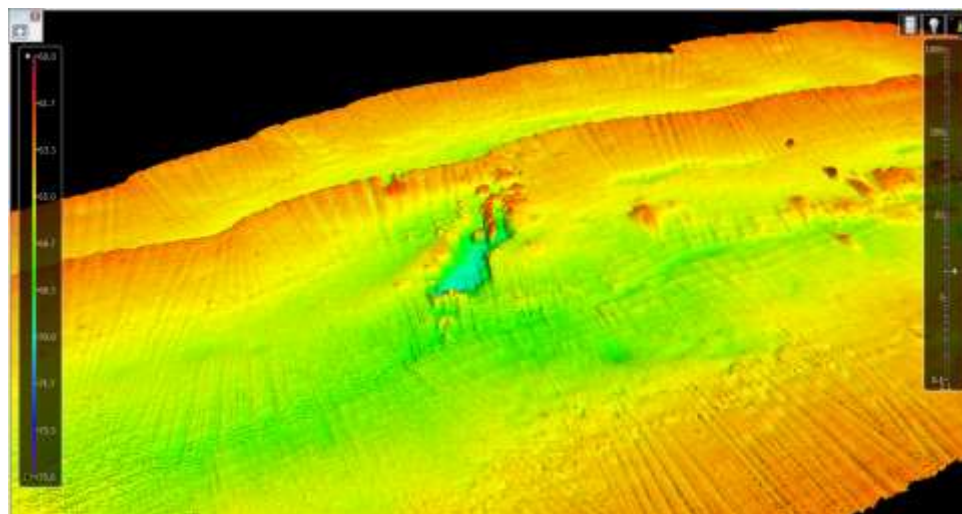


Figure 4: Surface grid 1m bin in 3D View.

Trench wreck Site A Length 166.52 meter [248-15-19.49N].

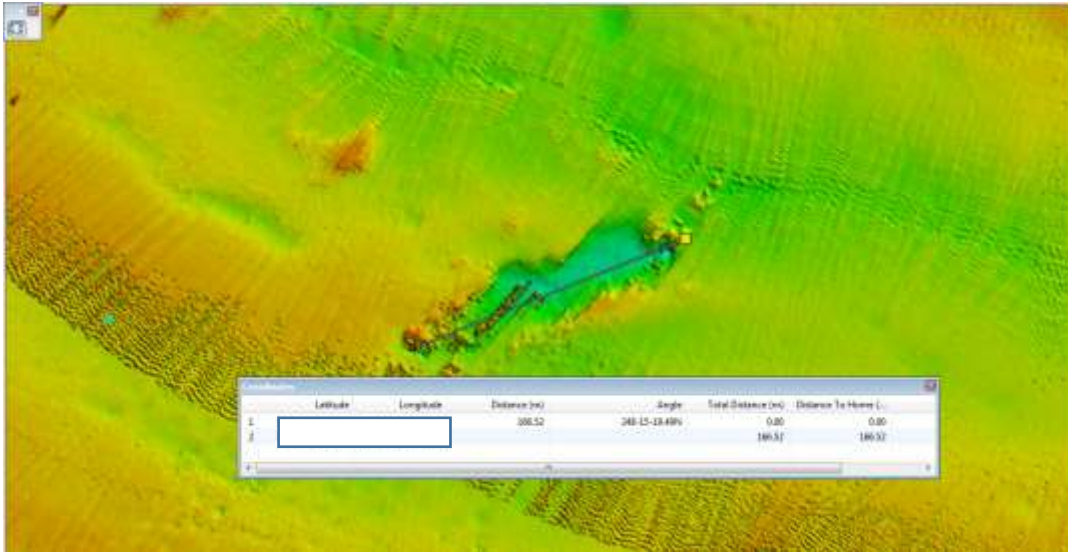


Figure 5: Trench Length Measurement.

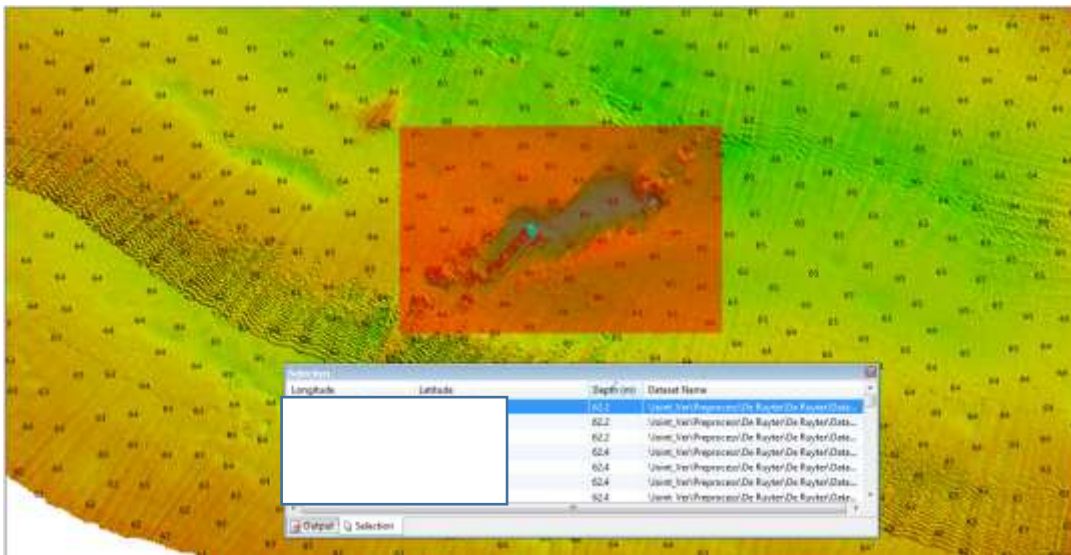


Figure 6: Trench position.

Wreck Site A Position:

	Latitude	Longitude	Depth (m)
1			62.2

Seabed depth average 65 meter.

Site B

The position of the trench on the Multibeam snapshots (figure 10) is in consistency with the position as stated as the find position (located 2002). The trench is round 130 metres long.

Based On Raw Data:

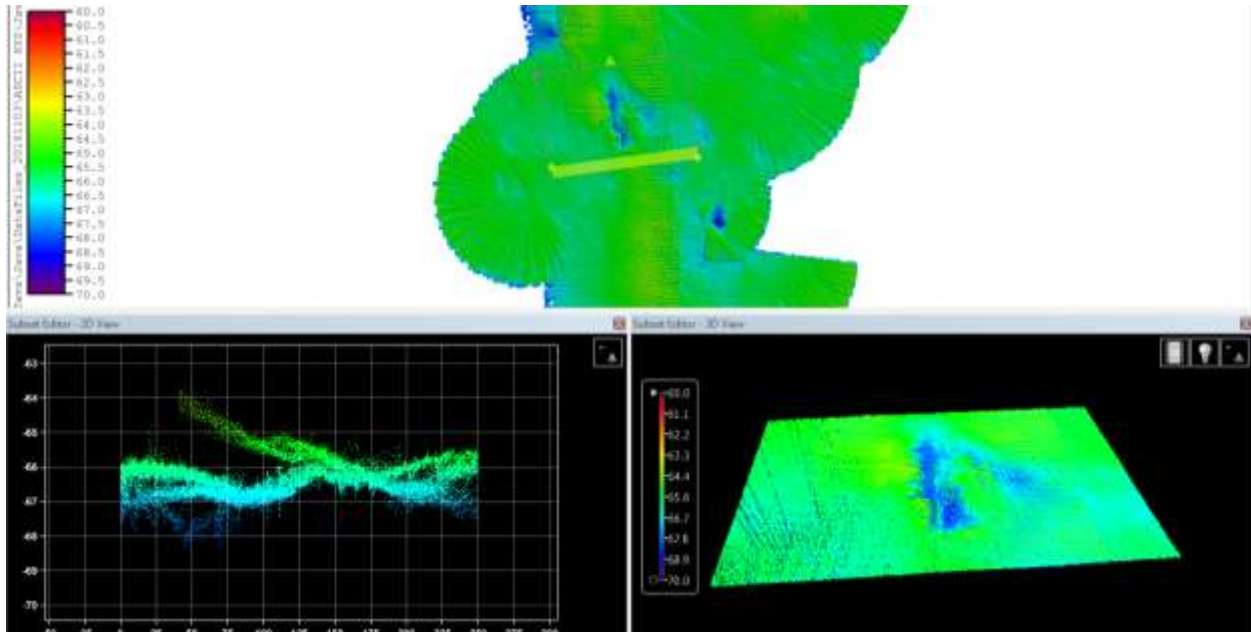


Figure 7: Examining MBES Data Surface Grid 1m bin, 3D and 2D Point Cloud.

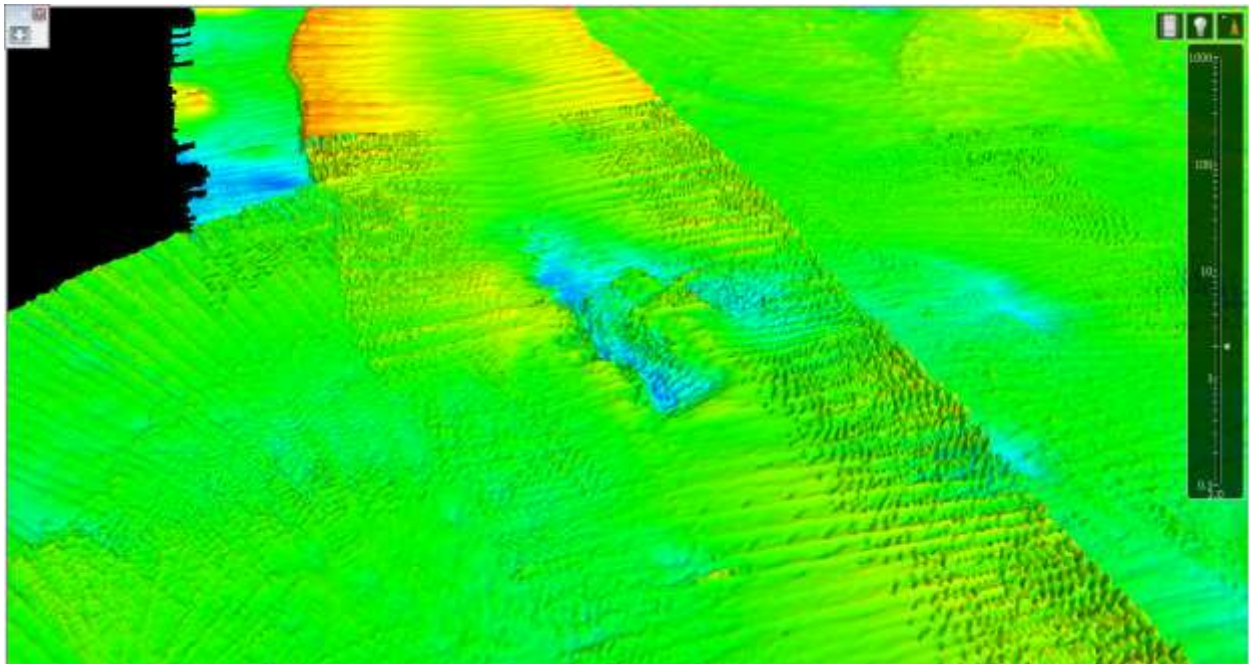


Figure 8: Surface grid 1m bin in 3D View.

Trench wreck Site B length 128.71 meter [346-53-47.62N].

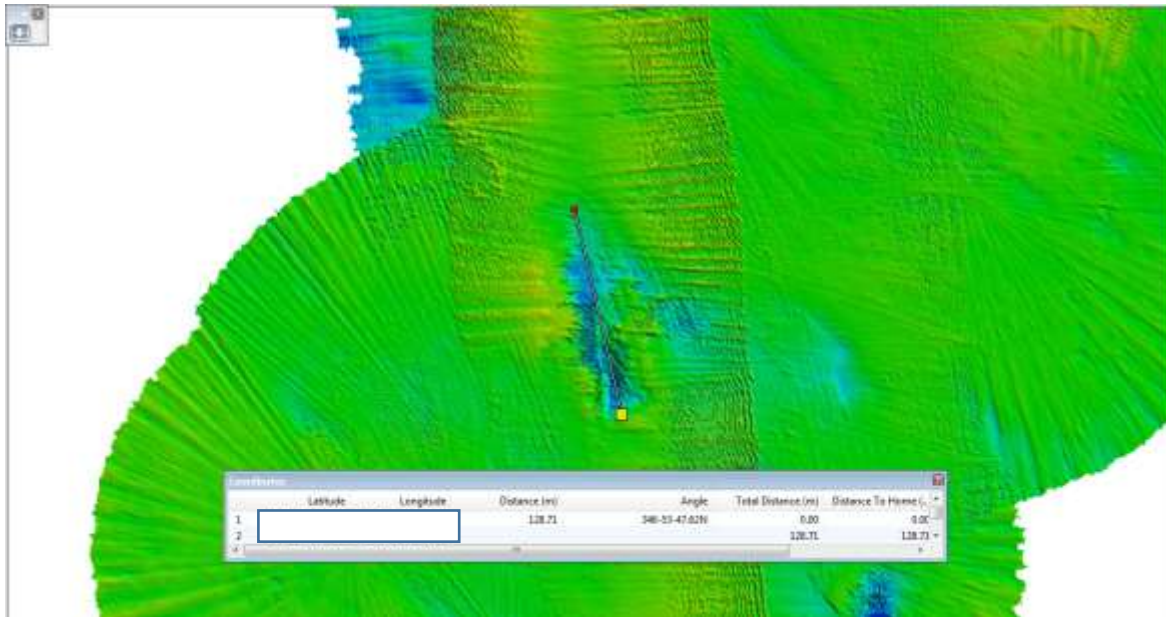


Figure 9: Trench Length Measurement.

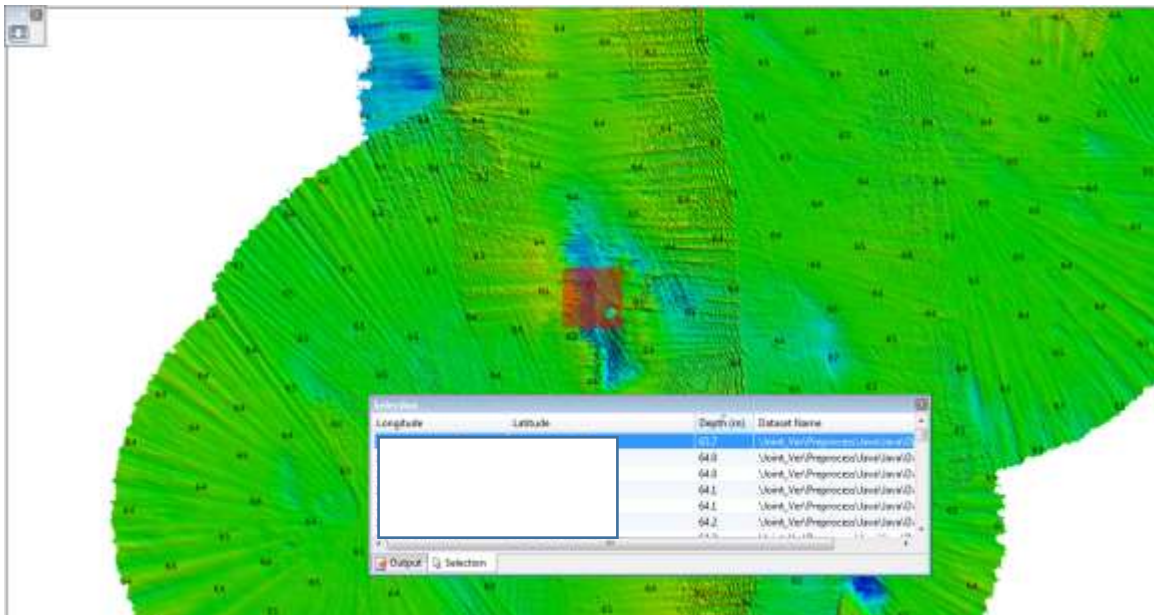


Figure 10: Trench Position.

Wreck Site B Position:

	Latitude	Longitude	Depth (m)
1			63.7

Seabed depth average 63 meter.

Site C

The position of the trench and some wreckages on the Multibeam snapshots (figure 14) is in consistency with the position as stated as the find position (located 2004). The trench is around 165 metres long.

Based On Raw Data:

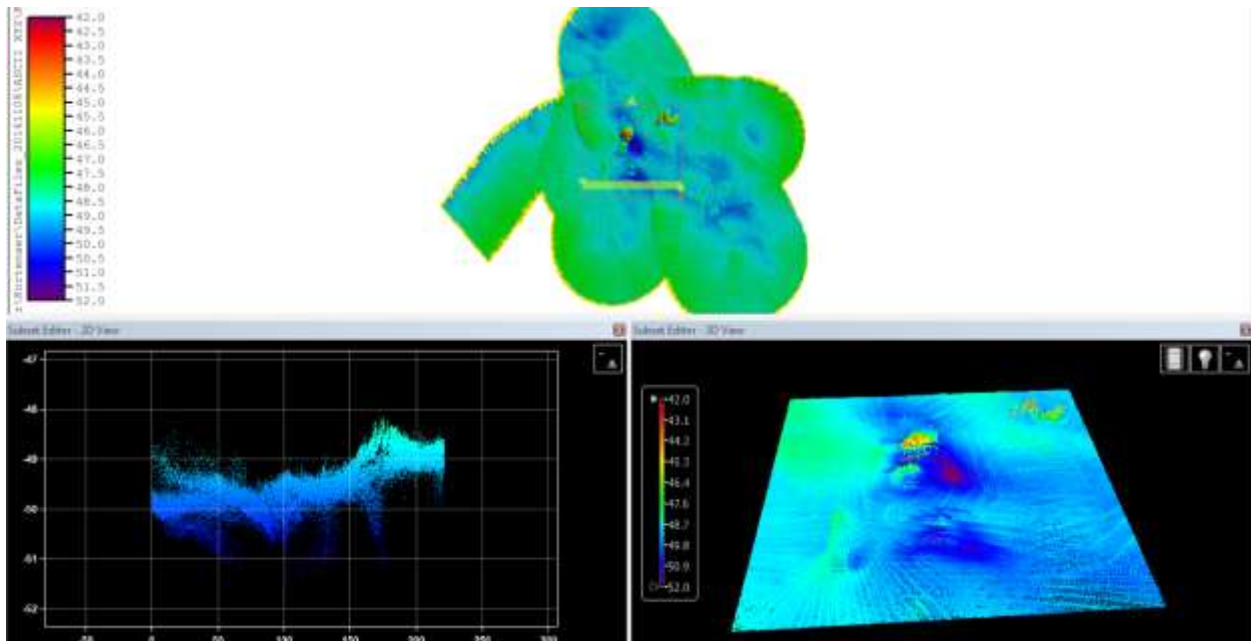


Figure 11: Examining MBES Data Surface Grid 1m bin, 3D and 2D Point Cloud.

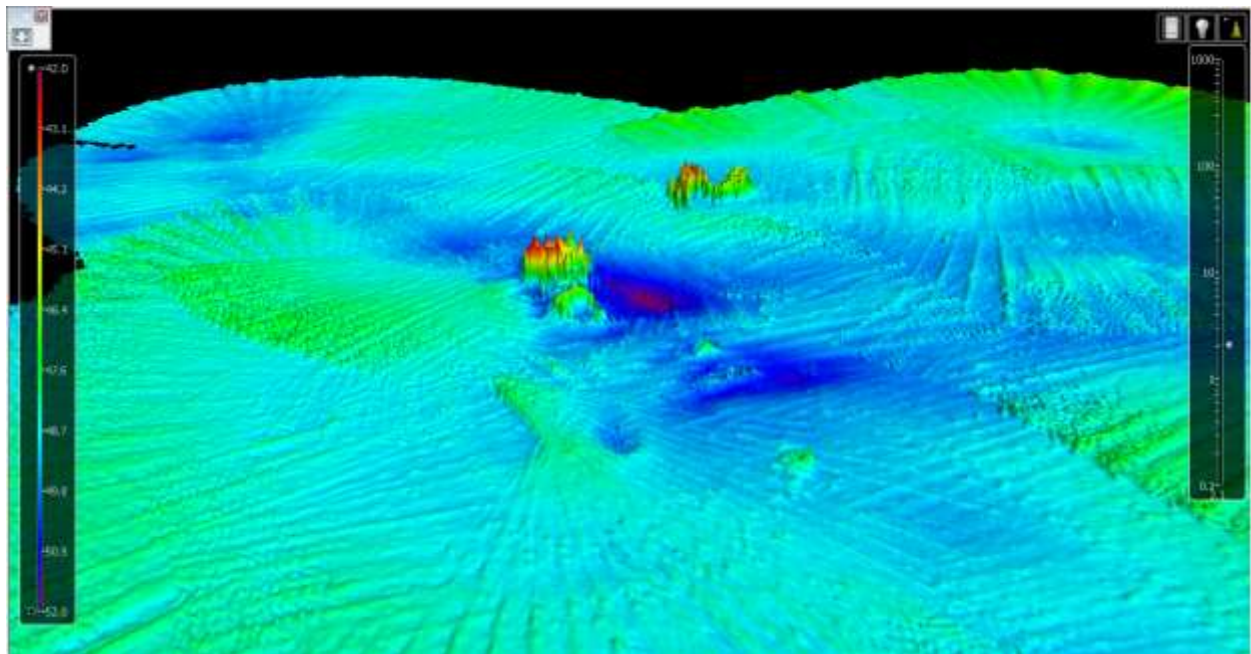


Figure 12: Surface grid 1m bin in 3D View.

Trench wreck Site C Length 164.36 meter [345-13-06.93N].

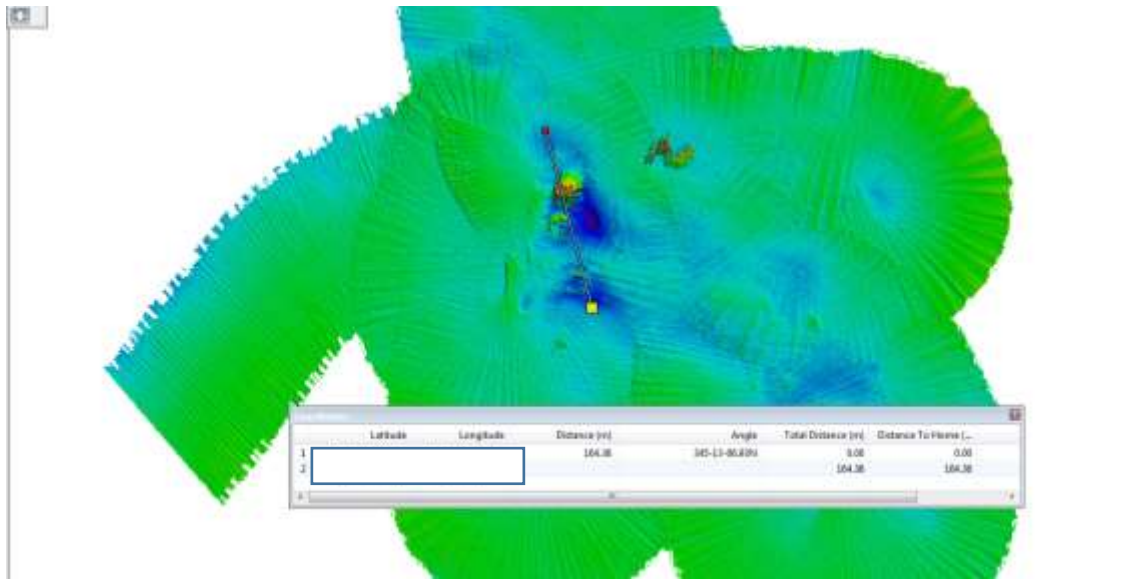


Figure 13: Trench Length Measurement.

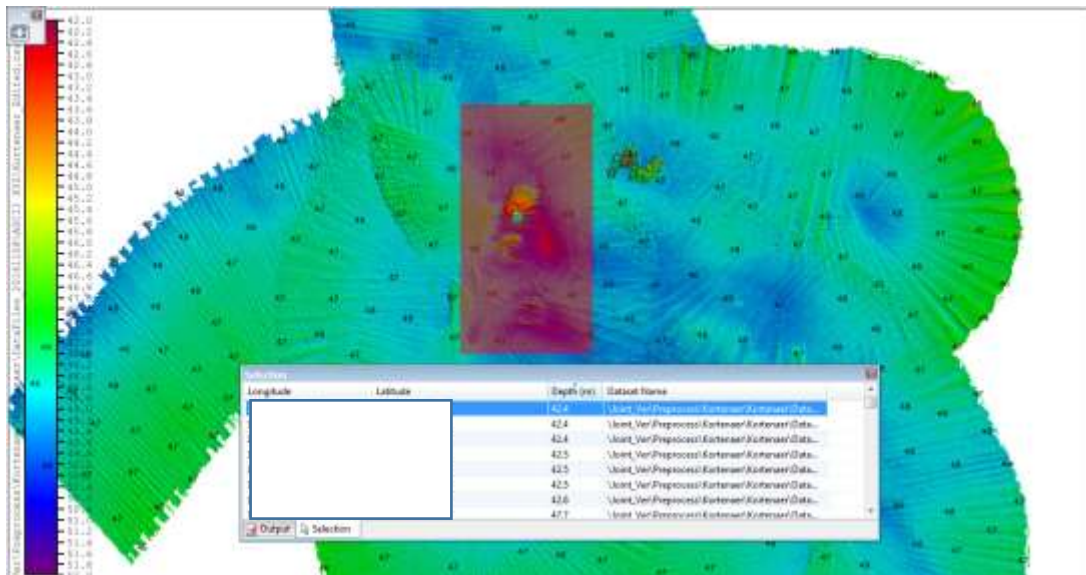


Figure 14: Trench Position.

Wreck Site C Position:

	Latitude	Longitude	Depth (m)
1			42.4

Seabed depth average 48 meter

Note:

Depth Value needs to be examined due to noise and tide correction (not valid to put in chart).

Identification and condition of the wrecks based on information of dives in 2002 and 2008

A short description for each wreck was made by one of the discoverers Kevin Denlay. His identification has been analysed and other convincing information has been included. After this, deduction was used in the identification of the wreck sites. The three wrecks have never officially been surveyed (by governmental institutions), but after their discovery a limited but systematic video survey of the wreck site A and B was done in 2008 by tech diver Andrew Fock. In addition, in 2009 some photos were made of Site A by tech diver Alex Towns⁷.

The bearings in the descriptions below may have a relative bearing. This is the bearing relative to the ship's fore and aft line, without reference to any meridian. Here the port side is referred to as the 'red' side, and the starboard side as the green side (see fig 15).

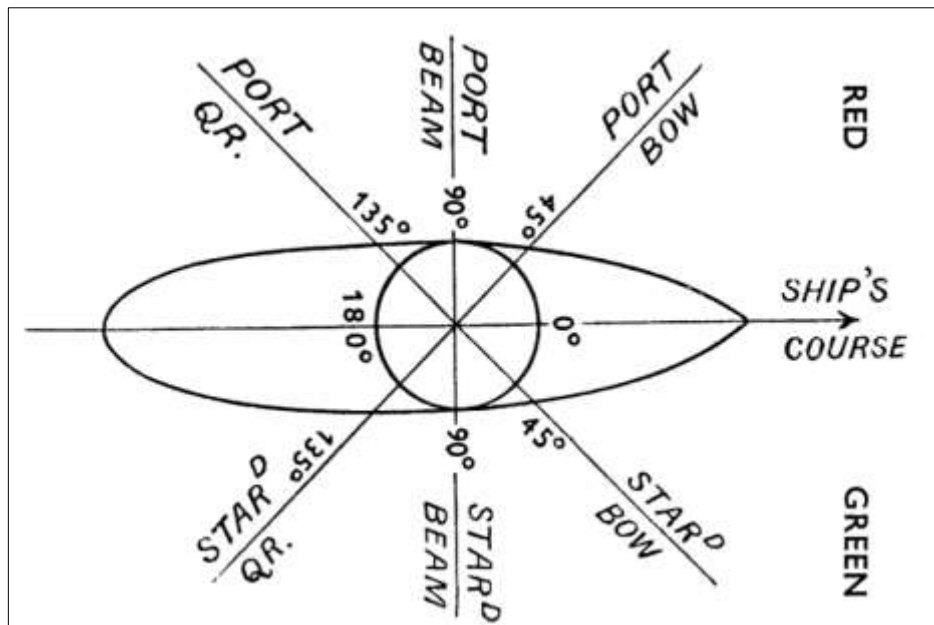


Figure 15: Red and green bearings explained.

⁷ [http://www.tinfish.biz/Diving/Indonesia%20-%20Java%20Sea%20\(October%202009\)/HNLMS%20De%20Ruyter/slides/HNLMS_De_Ruyter-013.html](http://www.tinfish.biz/Diving/Indonesia%20-%20Java%20Sea%20(October%202009)/HNLMS%20De%20Ruyter/slides/HNLMS_De_Ruyter-013.html) - on 08-02-2017.

1. Site A

2002

The wreck at location Site A was found upright at a depth of 69 meter, with the bow pointing upward, and tilted over to starboard. The armament remained almost intact. Tech divers identified the ship as the Hr.Ms. *De Ruyter* by the unique construction of the bridge, which had big searchlights surrounding it, and the gun turrets. *De Ruyter* had an unusual configuration of forward gun turrets. Due to political wrangling in the Netherlands at the time of her design, *De Ruyter* was fitted with one single and one dual gun turret forward to save money in construction. This unusual configuration of turrets was observed by the divers in 2002. Clearly visible are also the letters E and R of *De Ruyter's* name on the stern (see figure 17). Slightly further aft, just on the other side of the split that runs down the port side hull, the letters T, E and R of *De Ruyter's* name lay disattached from the hull, apparently dislodged as a result of the shock from the torpedo hit that sank her (see figure 18). These letters can also be seen on several historical photos of the warship. A large hole in the hull on the port side shows a torpedo impact.⁸

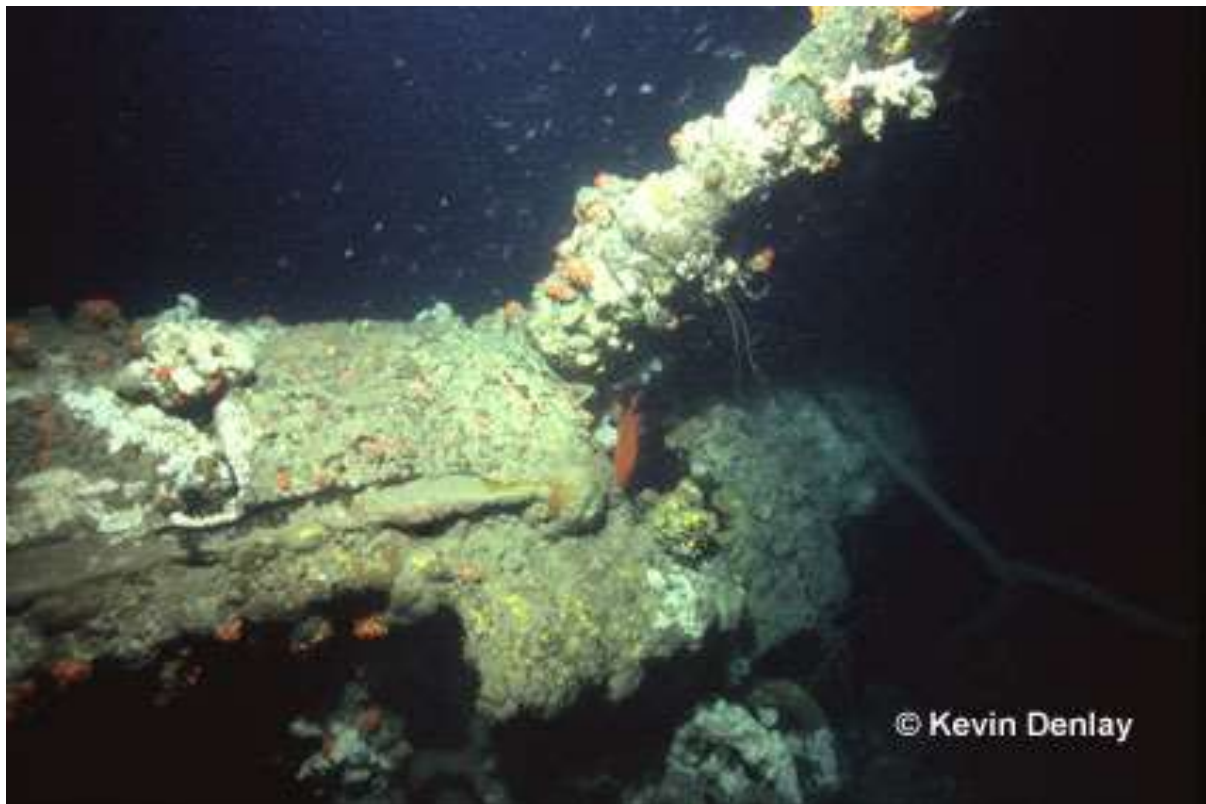


Figure 16: Looking from a lower angle at the face shields on *De Ruyter's* Bofors guns. This one is taken looking at the face from below and to the left. The twin barrels point out to upper right.

⁸ Denlay 2004, 26-27.

No historical photo shows the protective shields in place on *De Ruyter* and when underwater photos of these shields (see figure 16) were first seen they apparently caused somewhat of a controversy as many people were completely unaware that *De Ruyter's* Bofors were actually shielded.⁹ Originally these shields had not been installed on the ship, but historical information revealed that they were added on just right before the battle started. The details described above makes the identification of the wreck of that of the *De Ruyter* admissible.



Figure 17: While the letter D is hidden by a small coral bush on left, the letters E and R of *De Ruyter's* name, as seen in historical photos on her stern, are clearly visible. A large gash or split runs down *De Ruyter's* port hull just to the right of the letter R.

⁹ <http://www.netherlandsnavy.nl/index.html> - on 08-02-2017.



Figure 18: The remaining letters of De Ruyter's name lay jumbled.

2008

At the time of the 2008 video survey Hr.Ms. *De Ruyter* was laying intact and upright, tilted to starboard at approximately 30 degrees. The starboard guardrail was nearly at the level of the seabed. The forward rangefinder atop the bridge tower had lost its port arm. The forward gun turrets were trained to approximately Green 90. Figure 19 shows a small hatch along the side of the no. 1 turret.¹⁰



Figure 19: A small hatch (bottom middle/right) along the side of the no. 1 turret.

¹⁰ Fock 2016, 2-3.

Expended 15 cm cartridge casings were found scattered around the seabed on the starboard side (see figure 20). The *De Ruyter* had seven 15 cm Bofors guns (see Appendix 4).



Figure 20: One of the 15 cm cartridge casings.

The helm and telegraphs were still *in situ* (figure 21).



Figure 21: One of the telegraphs found to be *in situ*.

The five 40 mm Bofor guns on the aft deckhouse (above the captain's cabin) were *in situ* and demonstrated the protective shield fitted just prior to her sailing. The aft turrets were still in cruising position pointing towards the stern.



Figure 22: The aft turrets pointing towards the stern.

2016

In 2016 the divers reported a large trench (170 m) lined with subsurface mud and clay. This can also be observed from the videos. This clayish seabed surface had large gouges through it, consistent with the use of a claw. Some small debris was located including a section of torn thick metal hull plating containing a scuttle. The deadlight observed and photographed was of the pattern seen on historical pictures of *De Ruyter* (compare figure 23 with 24 and 25). Preliminary research executed by the expert team could only reveal that these deadlights were used on Dutch light cruisers but it remained unclear if these were only specific for *De Ruyter* or if they were also present on the *Java*. It is unclear if there will be remaining debris in the thick subsurface clay that is now covering the seabed.¹¹

¹¹ Fock 2016, 6.



Figure 23: Torn hull plating and scuttle with deadlight at the *De Ruyter* site. The bronze deadlight with the cross on it is typical of those seen in Dutch cruisers and quite unlike the Admiralty pattern ones on HM and HMA ships.



Figure 24: Pre-war photograph, crew quarters *De Ruyter*. Note pattern on deadlights compared to figure 23.



Figure 25: Pre-war photograph, crew quarters *De Ruyter*. Note pattern on deadlights compared to figure 23.

2. Site B

2002

In 2002 the keel of the wreck at Site B lay at 67 meters deep, and the ship was tilted over to starboard. According to Mr. Denlay the rear of the ship was badly damaged by an explosion as a result of the impact of a torpedo. A funnel with a unique 'baffled' base was also observed. Shell casings were found scattered over the site, indicating that this was not only a warship but a large one. The configuration of the objects also showed that she had gone down fighting.¹² This all helped to identify the wreck as that of the light cruiser Hr.Ms. *Java*.



Figure 26: Unused (i.e. 'live' unexploded) 5.9 inch / 150mm projectiles laying against a bulkhead on the Dutch cruiser Hr.Ms. *Java*. The long thin strips (foreground) are cordite from inside the brass shell casings that would have been loaded with the projectiles.



Figure 27: The unique 'baffled' base of the funnel that helped quickly identify *Java*. Sticks of cordite can still be seen protruding from the 15cm (5.9 inch) shells.

¹² Denlay 2004, 27.

2008

Site B, now identified by the divers as the Hr.Ms. *Java*, was still laying on her starboard side. The forward, remaining after and portside 15 cm gun mounts were trained to approximately Red 90 (figure 28).



Figure 28: No. 1 gun mount trained to approximately Red 90.

The bridge structure was intact with the frame for the canvas roof still present. Both the helm and telegraphs were present on the bridge (figure 29).

Targeting equipment and searchlight supports were all still *in situ*. The 40 mm Bofor anti-aircraft guns were found *in situ* as well on the aft deckhouse as was the forward of the two 15 cm gun mounts aft of them, However, the stern was missing, shortly aft of this gun mount and located some 200 m away. The ship was considerably torn up in this area.



Figure 29: Triple telegraph still present on the bridge.

2016

The diving operation in 2016 revealed a similar topography to the *De Ruyter* site (a large trench of 130 m) with subsurface mud/clay in the trench. Several scattered thick torn hull plates and minor fittings were found around the site. A 15cm copper-alloy cartridge case was recovered to help identification of the site. Base markings showed it to be indeed of Dutch manufacture and of the type used by Hr.Ms. cruisers.¹³



Figure 30: Base markings 15cm cartridge case from the *Java* site. Note the Dutch crown and manufacture date 1922.

3. Site C

2004

Divers first found the foredeck of Site C, two years later than site A and B, at a depth of 52 meters. However, they could not identify the wreck due to bad visibility. The foredeck was completely upside down. Several Dutch Bols (Jenever) bottles were observed by the divers on the seabed. The only indication at that time that the metal wreck was a warship was a very large searchlight laying on the seabed amidships where the ship had been broken. Only when the other half of the ship, the stern, was found thirty to forty meters away, heavily covered by fishing nets, the iron wreck with thin plating could be positively as the destroyer Hr.Ms. *Kortenaer*. The stern section was laying well over on its starboard side, with propellers and rudder visible and one set of triple torpedo tubes visible amongst the large amounts of fishing net that was draped over the wreckage. Besides the wreckage being in consistence with the way the *Kortenaer* went down, no other warship lost in that area had triple torpedo tubes.¹⁴

¹³ Fock 2016, 9-11.

¹⁴ Denlay 2004, 26-27.

2016

During the expedition of 2016 divers reported that the upturned aft section of the wreck remained embedded in the mud, but that machinery spaces had been opened and condensers (among other things) had been removed. Multiple tears were seen on the remaining hull side with fresh corrosion indicating that attempt had been made to take this section.¹⁵ It remains unknown why the salvagers did not salvage the other parts of the ship. Perhaps it was decided that the thin corroded nature of the hull was not worth taking after all. However, this is speculation.

The identity of the ship was confirmed by the retrieval of a 12 cm cartridge case. Base markings showed it to be of Dutch origin, manufactured at the *Hembrug Armoury* north of Amsterdam in 1929.¹⁶



Figure 31: 12 cm copper alloy shell case that was recovered from the *Kortenaer* site.

¹⁵ Fock 2016, 21.

¹⁶ Fock 2016, 21.

Conclusions

Positioning

The three positions of the wreck sites A, B, C are more or less consistent with data on the positions of the sinking of the Hr.Ms. *Ruyter*, Hr.Ms. *Java* and Hr.Ms. *Kortenaer*, Dutch warships lost at the battle of the Java Sea on the 27th of February 1942. In comparison with the historical data the *De Ruyter* and *Java* are lying close to each other, and the *Kortenaer* lies more south. While in all the publications that were used for this identification mission *De Ruyter* is reported to have been hit more to the north of *Java*, the sites identified are laying the other way around, with *De Ruyter* more south. The positions of both ships are however less than 4 miles apart from each other. When keeping in mind the moment when the positions were taken, in 1942, during battle, at night, southern latitude and with a *De Ruyter* that – turned over south – kept afloat for three hours, this doesn't surprise us.

Hydrographic data

A multi-beam echo sounder (MBES) system is normally used to measure depths and it can also be used to measure the depth differences of the bottom. It is possible to detect trenches or large wrecks/obstructions. For official survey's (IHO standard 44) side scan sonar (SSS) is used to detect wrecks and obstructions and not a multi-beam echo sounder (MBES).

The MBES (WASSP33) used for the wreck investigation during the survey of the naval wreck sites Java sea 2016 is not a very sophisticated system with a low resolution. No patch test was conducted and the corrections for sound velocity were not applied and no tidal corrections were done. However, the used system in this configuration was adequate enough to find large wrecks and trenches. The used navigation system was also adequate. The survey of the naval wreck sites Java sea 2016 does not reach the IHO standard S44 and the data cannot be used for official charting.

That said, on the Multibeam pictures traces of seabed disturbance and objects on the seabed can be detected. On Site A, a large trench of approximately 170 m can be seen. The position of the trench on the Multibeam snapshot (figure 6) is in consistence with the position as stated as the find position (located 2002).

On Site B more or less a same kind of trench in the seabed of approximately 130 m long can be observed. The position of the trench on the Multibeam snapshot (figure 10) is in consistence with the position as stated as the find position (located 2002).

On site C a shallow trench and some wreckages can be observed on the seabed. The position of the wreckage on the Multibeam snapshots (figure 14) is in consistence with the position as stated as the find position (located 2004).

There is no other hydrographical (Multibeam, sidescan sonar, etc) data available from before 2016. So no comparisons can be made to define the exact location and the change of condition of the ship wrecks.

Video and Picture Data:

The shipwrecks shown on the pictures and the videos are warship remains. Site A and B contain remains of thick iron plated ships, while the wreck on Site C has considerably thinner plating.

Referring to the features appearing on the videos and pictures from 2002 and 2008, it can be identified that the shipwrecks are Hr.Ms. *De Ruyter* and Hr.Ms. *Java*. Referring to the features appearing on the videos from 2016, it can be identified that one of the ship wrecks is Hr.Ms. *Kortenaer*. All three sites are consistent with the historical data used for this research on the wrecking of the three Dutch warships.

Overall conclusion

Referring to the analyses of the positions, Multibeam data and the videos and photos made of the wreck sites we can state that almost certainly Site A is the wreck location of the Hr.Ms. *De Ruyter*, Site B is the location of the Hr.Ms. *Java* and Site C is the Hr.Ms. *Kortenaer*. Positions and ship features are quite consistent with the historical data related to the battle, the ships and their sinking.

The combination of video, photo and Multibeam data confirms the salvaging on all three locations. The extent of salvaging may have to be verified onsite.

Recommendations

In the 2016 expedition report it is mentioned that the divers were required to use a line to successfully return to the shot line at the *De Ruyter* and the *Java* site. This has limited the search area to probably not more than 100 meter (circular) around the shot line. Also the Multibeam data collected on site is not of standards according to IHO. All information up until now is collected by third parties. The team of experts were able to conclude that the information gathered was sufficient to identify the sites as being that of the *Ruyter*, *Java* and the *Kortenaer*. It was also verified that the wrecks have been salvaged from the seabed. The extent of removal could not be verified.

- The expert team considers the information gathered on the wrecks convincing enough to identify the wrecks. We recommend that no immediate field survey is needed to identify the wreck sites during this stage.

Although the expert team considers the information gathered on the wrecks convincing enough to identify the wrecks they also stress the importance of a follow up that would include the visit of the wreck sites soon, at least in the following years in order to collect the necessary hydrographic and archaeological data needed for future management. The team also stresses the importance of a joint collaboration between the Netherlands (as the flag state) and Indonesia (as coastal state) in these future stages. We therefore recommend that:

- A systematic archaeological and hydrographical data collection as part of a baseline study for future management will be undertaken.
- Exact positions (especially depth data of the *Kortenaer*) according to IHO standards are recorded to be investigated for safety navigation.
- The Netherlands Government applies for official inclusion into the Hydrographic Charts made by the Indonesian Government.
- A protection of the three wreck sites under the chart specification of the IHO S-4 as 'Historic Wreck' will be executed.

A new proposed survey should provide the following deliverables:

- Still images of the three war wrecks. Focusing on the tracks on the bottom, which appear to be from salvaging equipment.
- Videos of the locations (e.g. with ROV), focusing on tracks on the bottom, which appear to be from salvaging equipment, and on remains of the *Kortenaar* (e.g. for photogrammetry).
- Side scan sonar, multi beam and sub bottom profiler images, magnetometer data of the locations. Sub bottom profiler and magnetometer is to see if there are remains of the wrecks left in the bottom.

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APPENDIX 1

Additional historical data on the Battle of the Java Sea

Introduction

In September 1940, as a response to the Japanese military expansion and the Second Chinese-Japanese war, the United States and the British, Australian and Dutch government decided to impose an embargo. This meant that no oil, iron ore, steel and other materials were to be delivered to Japan any longer. Japan does not have these materials as natural resources, and had to halt their military activities. The Japanese government was very nationalistic and saw the embargo as an act of aggression against the Empire. Since Japan only had limited oil reserves, they began planning for war and the take-over of Thailand, Malaysia, Singapore, Philippines and the Dutch East Indies. Especially Malaysia and the Dutch East Indies (respectively part of English and Dutch territory) were rich in natural resources and formed the main objective of the plan.¹⁷

The Japanese foresaw a war against England, and assumed that the United States would ally themselves with the United Kingdom (and thus also the Netherlands) if they would attack British territory. That is why the Japanese considered it necessary to take out the American fleet.¹⁸

Declaration of war: Pearl Harbor

On Sunday December 7 1941 the American fleet was anchored at its base at Pearl Harbor on Oahu, Hawaii, when the Japanese struck. The attack came as a complete surprise, and the American fleet suffered heavy losses. Eight of the nine battleships were destroyed or disabled. Numerous smaller vessels were also destroyed or disabled. The Japanese had achieved their goal, and no longer felt the threat of the great American fleet in the Pacific. The Americans immediately declared war after the attack. The Japanese intentions were now clear. On the same day as Pearl Harbor, they attacked Hong Kong, the Philippines, Thailand, Malaysia, Guam and Wake Island. The Dutch government saw no other choice the next day, on December 8, than to declare war on Japan.¹⁹



Figure 32: An U.S. battleship sinks during the Pearl Harbor attack.

¹⁷ Bezemer 1987, 152-161.

¹⁸ Bezemer 1987, 162.

¹⁹ Nater 1980, 23.

The formation of the Combined Striking Force

The Rising Sun of Japan rose higher and higher, and things looked desperate for the allies. The few warships that remained had to do without air support and were faced with the impossible task of attacking the Japanese fleet, which far outnumbered them. Towards the end of 1941 it was decided at a conference in Washington that there should be a 'unity of command in the Far East'. The Allies hoped to join forces to put an end to the Japanese advance. The result was that General Sir Archibald Wavell was appointed Supreme Commander of the ABDACOM (American-British-Dutch-Australian Command). However, it took until 15 January 1942 before this command came in operation. Soon after this, Vice-Admiral C.E.L. Helfrich, Commander-in-Chief of the Dutch maritime forces in the Netherlands East Indies, wanted the formation of a striking force. This striking force was finally formed on 3 February 1942, and consisted of the Dutch cruisers *De Ruyter* and *Tromp*, the American cruisers *Marblehead* and *Houston*, three Dutch destroyers, and four American destroyers. Admiral Doorman was appointed as the Commander of the Striking Force.²⁰

In the course of the following weeks the Striking Force had many changes of ships and saw action twice, on 15 February in the Gaspar Straits, and on the night of 19 and 20 February the battle of Badung Strait.²¹

On 21 February Admiral Helfrich, who had taken over command of the ABDA maritime forces exactly a week earlier, decided on the formation of two striking forces, a western and an eastern. Four days later reconnaissance planes reported the presence of a large Japanese invasion fleet in the Straits of Macassar, heading for the South. It was decided that the eastern force would be reinforced and the *Exeter*, *Perth*, *Electra*, *Encounter* and *Jupiter* were directed to Surabaya, where they arrived on 26 February. This force, The Combined Striking Force, was put under the command of Rear-Admiral Karel Doorman.²²



Figure 33: Rear-Admiral Karel Doorman.

The Battle of the Java Sea

On the afternoon of 26 February Doorman assembled the captains of the ships for a conference on the action that he intended to take, and on the tactics to follow in the event of an encounter with the Japanese. He expected that they would attempt to land troops on the night of 26-27 February, and therefore decided on a patrol along the north coast of Eastern Java and Madura. Nothing happened during this patrol, but when they entered the approaches to Surabaya to refuel the ships they received the news they had been waiting for. A Japanese convoy had been sighted near Bawean. The Combined Striking Force altered course straight away, and headed for the reported position.²³

²⁰ Legemaate *et al.* 1999, 112-113. Nater 1980, 23.

²¹ Legemaate *et al.* 1999, 113-116.

²² Legemaate *et al.* 1999, 117-118.

²³ Oosten 1974, 89.

The squadron was composed as follows:

- Two heavy cruisers: HMS *Exeter*, and the USS *Houston*.
- Three light cruisers: Hr.Ms. *De Ruyter* (flagship), Hr.Ms. *Java*, and the HMAS *Perth*.
- Nine destroyers: Hr.Ms. *Kortenaer*, Hr.Ms. *Witte de With*, HMS *Electra*, HMS *Encounter*, HMS *Jupiter*, USS *Alden*, USS *John D. Edwards*, USS *John D. Ford*, USS *Paul Jones*.

The Japanese fleet consisted of two heavy cruisers, two light cruisers and 14 destroyers.²⁴

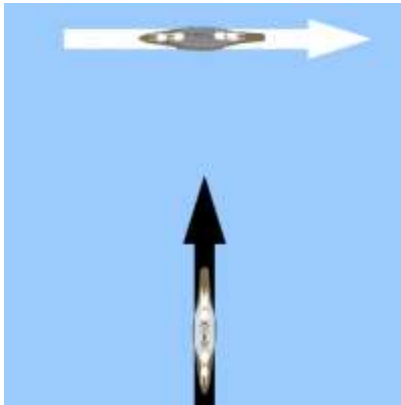


Figure 34: The ship near the top is crossing the 'T' of the ship on the bottom.

At 1620 the British destroyer *Electra* sighted the Japanese fleet to starboard and four minutes later fire was opened at a range of 30,000 yards. Doorman in his flagship *De Ruyter* was soon compelled to carry out an alteration of course to port to prevent the Japanese ships from 'crossing his T'. This is a classic naval warfare tactic, in which a line of warships crosses in front of a line of enemy ships, allowing the crossing line to bring all their guns to bear while receiving fire from only the forwards guns of the enemy.²⁵

However, Doorman's position got worse and his ships, amongst them *De Ruyter*, received hits. At 1708 the British cruiser *Exeter* was hit by an 8-inch shell which put six of her eight boilers out of action. Soon after that the destroyer *Kortenaer* received a torpedo hit. The Dutch hunter broke in two and sank at the end of the afternoon. The

American ship *Encounter* was ordered to stop and pick up 113 men of the *Kortenaer*'s crew of 153. The plan was to take the men to Batavia, but upon learning of a strong Japanese force to the west the captain returned to Surabaya.²⁶

Doorman managed to restore order in the confusion which had ensued and after he had ordered the *Exeter* to return to Surabaya, escorted by the *Witte de With*, the British destroyers went into the attack. Admiral Doorman's orders were, 'You must continue attacks until the enemy is destroyed,' and he pressed on north with a grim determination to reach the enemy convoy. The *Electra* found her way blocked by three Japanese destroyers and consequently met her doom. The flagship by this time led the remaining allied ships to the north in search of the Japanese invasion fleet, which had successfully remained out of sight. However, Japanese aircraft reported every move and enabled the Japanese Admiral to keep his ships between the convoy and Doorman's force.²⁷



Figure 35: The survivors of the *Kortenaer* see the Allied cruisers pass by.

²⁴ Nater 1980, 55-56.

²⁵ Nater 1980, 63-64 & Oosten 1974, 92-93.

²⁶ Nater 1980, 67, 72-73.

²⁷ Oosten 1974, 93.

At about 1930 there was a brief exchange of gunfire between the Allied ships and some of their opponents. Doorman soon afterwards changed course towards the coast of Java; at 2100 he changed course again, now to the west, while the American destroyers left for Surabaya. Nearly half an hour later the *Jupiter* struck a mine and sank. The *De Ruyter* then moved with the remaining three cruisers on a northerly course. Shortly before 2300 hours two ships were dimly seen to port. They were the heavy cruisers *Nachi* and *Haguro*, steaming south, but reversing course immediately. Fire was opened and torpedoes were launched. For the *De Ruyter* and the other Dutch cruiser *Java* these would prove fatal. At 2332 the *Java* was hit, and two minutes later the flagship was hit by a torpedo launched by the *Haguro*. This meant the end of the *De Ruyter*, who sank nearly two to three hours later.²⁸

Aftermath

With the *De Ruyter* about 79% of her crew went down, amongst them Doorman and the commanding officer. The explosion of 40mm ammunition caused many casualties, and once the ship was stopped many survivors lost their lives in the burning oil, which streamed freely out of the ship. In total more than 2,200 people died on the Allied side during the Battle of the Java Sea. The Japanese suffered minimal losses. The demise of the Hr.Ms. *De Ruyter*, Hr.Ms. *Java* and Hr.Ms. *Kortenaer*, costed more than nine hundred Dutch crewmembers their lives. The destroyer *Witte de With* suffered serious damage and was taken out of service later on.²⁹

Materially the Japanese were stronger than the Allies, but other factors seem to have had a large impact on the fight in Japanese advantage. The Allied troops were exhausted after weeks of patrols and communications between the ships were problematic. The allies also lacked air support, so the course was not clear. In addition, the long-distance torpedo was crucial. The Allies were not well aware of this Japanese innovation, allowing their ships to be taken out one by one from a distance. The Japanese ships meanwhile were out of reach for the weapons on Allied ships.³⁰

The Australian cruiser HMAS *Perth* and the US cruiser USS *Houston* were lost during night action in the Sunda Strait between 28 February and 1 March 1942. The British cruiser HMS *Exeter* and destroyer HMS *Encounter* were lost on 1 March 1942 during the Second Battle of the Java Sea whilst the US submarine USS *Perch* was lost to Japanese warships on 3 March 1942. Some 2173 Allied sailors were lost as a result of these actions while many more became prisoners of war, subsequently suffering severe deprivation and cruelty.³¹

²⁸ Oosten 1974, 93-95.

²⁹ Oosten 1974, 95.

³⁰ Flipse 2012.

³¹ Fock 2016, 1.

APPENDIX 2

Information from the literature

Helfrich memoires (1950)

Page 412:

The *Kortenaer* has broken literally in half; both ends stand straight up in the water before sinking simultaneously.

Page 422:

The Hr.Ms. *Ruyter* received two torpedoes and the Hr.Ms. *Java* one. The flagship sank deep in the water and heavy fires were seen.

The *Java* stood up straight with the bow up. Its position was 6 degrees 11 minutes S and 112 degrees 8 minutes E. (Time 27 February 23:30h).

Bezemer (1987)

Page 321: (first hit). At 4.31 PM the flagship *De Ruyter* received a hit from a 200 mm grenade, which made a remarkable way through a part of the ship without exploding, but none the less damaging the ship. The heavy grenade hit on starboard side above the door of the bakery, ricocheted and went through the diesel engine room making damage and injuring several people, it went through different other rooms damaging the batteries, causing explosions of the CO2 cylinders and disappeared in the oil bunker.

A second grenade went through the mariners room and another through the infirmary. However, these two grenades also did not explode.

Page 325: The torpedo, that hit us more or less mid-ships, broke the *Kortenaer* in two. The ship was thrown on her starboard side. Both halves of the ship were now standing straight up with the break-ends in the water, as towers of a cathedral. The rudder and both propellers were standing high above the water. After a short while the rear part of the ship fell on its side and disappeared. The bow however floated for a much longer time. The closed portholes held the air inside with enough capacity to carry the weight if this part of the ship.

Page 338: *De Ruyter* received a hit above the armoury deck, the grenade left the ship on the other side again and did not explode.

Page 339: *De Ruyter* was still making a wide turn when an enormous explosion took place on the deck of the *Java*, which set the ship on fire. One of the heavy Japanese torpedoes had hit the Dutch light cruiser in the aft right behind the ammunition storage. The results were fatal. On the bridge they concluded that the ship could no longer be moved, didn't respond to the rudder and was capsizing. The aft broke off and the commander Capt. T.z. van Straelen had to order to abandon ship immediately.

Soon after, approximately 20 minutes after the torpedo hit, the *Java* disappeared in to the waves with the stem straight up.

Page 340: Not even two minutes after the *Java* was put out of action, the *De Ruyter* met the same fate. The torpedo exploded at the level of the gear room. A wave of burning oil set the shelter deck on fire. Due to this, the 40 mm operational ammunition started to explode.

The *De Ruyter* did not sink, unlike the *Java*, shortly after it got hit by a torpedo. It would stay afloat for about three hours.

Page 342: Hr.Ms. *De Ruyter* and *Java* sank at about 6 degrees 11' S – 112 degrees 8' E in the Java sea, roughly 60 kilometers southwest of Bawean.

Bosscher (1986)

Page 284: The *Kortenaer* was making a turn when it got by a Japanese torpedo. An enormous explosion seemed to lift up the ship out of the water and drop it again. The hunter broke in half. The stem and stern of the ship lifted straight up out of the water, with which their decks were only two to 3 meters apart.

Page 291: The Hr.Ms. *De Ruyter* was hit starboard by one or two torpedoes around 23:30. That the ship was lost became apparent fast, but it only sunk one and a half hours later.

Also around 23:30 the *Java* was hit in the ammunition storage at the aft of the ship. A heavy fire started on the shelter deck. The aft broke off at the level of the longroom, the machine chamber was flooded, and the ship was capsizing to starboard. Within 15 minutes the *Java* sank.

Page 291 & 292: The Captain of the *Perth*, Captain at sea H.M.L. Waller, signaled around 1 in the morning: 'Returning to Batavia. *De Ruyter* and *Java* both disabled by heavy explosions in position 006 degrees south 112 degrees east.'

Kroese (1944)

Page 81: Around 17:15 in the afternoon the Hr.Ms. *Kortenaer* was hit by a torpedo. The enemy projectile hit the destroyer midships in the machine chamber and the ship broke in half.

Nater (1980)

Page 67: Several minutes later, at 17:15, the destroyer *Kortenaer* was hit midships by a torpedo. Within fifteen seconds the *Kortenaer* broke in half, with which the stem and stern of the ship were standing straight up next to each other. Bow, rudder and screw were above the water. Due to the explosion the mist generator started working, and heavy white clouds hang above the wreck.

Pages 73-75: In those minutes the *De Ruyter* received a grenade hit on the quarterdeck. The grenade did not explode, but it pierced the armour of the deck and left the ship again without causing too much damage. When the *Java* made a wide turn to starboard an enormous burst of flame, a heavy explosion, took place on the ship. The *Java* had received a torpedo hit at the stern of the ship, close to an ammunition storage. The explosion of the torpedo and the ammunition had fatal consequences. A part of the stern broke off. Within minutes the *Java* had capsized about 40 degrees. The burning aft sank quickly. After about 20 minutes the burning wreck of the *Java*, with the stem upwards, sank sizzling beneath the waves.

Two minutes later, a Japanese torpedo hit the stern of the *De Ruyter*. The torpedo hit caused an enormous explosion. The ship started to capsize immediately but, unlike the *Java*, it did not sink quickly.

Both Dutch cruisers lay at the bottom of the Java sea at about 20 kilometers southwest of the island Bawean, more precisely at 06 degrees 00 Z.B. 112 degrees 05' O.L.

APPENDIX 3

Known artefacts lifted from the wrecks

In 2004 four ship bells were sold that were taken from the wrecks of the Hr.Ms. *De Ruyter* and Hr.Ms. *Java*. Two of the bells were from the *De Ruyter* and two of them were from the *Java*. The bells were bought by Henk Visser who consequently cleaned and conserved them. In 2005 Visser gifted the bells to the Royal Netherlands Navy. The Marine Museum in Den Helder manages the bells for the Royal Netherlands Navy.³²

One of the *De Ruyter's* bells now hangs in the Kloosterkerk in The Hague (see figure 36). The bell hangs next to a Karel Doorman plaque. Every year on 27 February the battle in the Java Sea is remembered in the Kloosterkerk, whereby a wreath is layed at the plaque.³³



Figure 36: The De Ruyter bell in the Kloosterkerk.

The second bell from the *De Ruyter* was placed in the hall of the 'Commandementsgebouw' in Den Helder.

³² <http://www.veteranen-online.nl/maritiem/javazee.htm> - on 08-02-2017.

³³ <http://www.veteranen-online.nl/maritiem/javazee.htm> - on 08-02-2017.



Figure 38: This bell of the *Hr.Ms. Java* now hangs at the National Military Museum in Soesterberg.



Figure 38: The bell of the *Java* at the Karel Doorman monument in Surabaya.

One of the *Hr.Ms. Java*'s bells was placed at the Karel Doorman monument, honorary field (Dutch War Cemetery) Kembang Kuning, in Surabaya (see figure 38). Victims and prisoners of war from internee camps in East Java, the military of the Royal Netherlands Army, the military of 'Koninklijke Nederlandse Indische Leger', and the military of Royal Netherlands Navy were buried here. 'Vereniging Onze Vloot' gave this bell to the *Java* when it entered into service in 1925.³⁴

The other bell of the *Java* is now part of the collection of the Marine Museum in Den Helder. This bell is loaned to the National Military Museum in Soesterberg, where it is displayed.

³⁴ <http://www.veteranen-online.nl/maritiem/javazee.htm> - on 08-02-2017.

A challenge cup from Hr.Ms. *De Ruyter* is also part of the collection of the National Military Museum in



Figure 39: Challenge cup of the HNLMS *De Ruyter*.

Soesterberg (see figure 39).³⁵

In 2014 three speaking tubes were put up for auction in Perth, Australia (see figure 40), but confiscated beforehand. Thanks to a lot of diplomatic work these object were finally sent back to the Netherlands. They are now part of the collection of the Marine museum in the Netherlands.³⁶



Figure 40: Figure 40: One of the three speaking tubes from the *De Ruyter*.

³⁵ <http://www.vriendenvanbronbeek.nl/3%20Nieuws2015peechslagjavazee.htm> – on 08-02-2017.

³⁶ <https://www.defensie.nl/actueel/nieuws/2014/10/15/onderdelen-scheepswrakken-na-73-jaar-weer-in-thuisbasis> - on 08-02-2017.

Objects 2016

During the expedition of 2016 four items were taken from the seabed. According to the divers they were taken up after they noticed the ships had disappeared, in order to be able to identify the location and to proof the locations A, B and C were Hr.Ms. *De Ruyter*, Hr.Ms. *Java* and Hr.Ms. *Kortenaer*.

After being taken up, the objects were labelled and taken into custody by the Oorloggravenstichting in Surabaya. They were made available for the expert team on the 8th of February.

The objects presented are:

- A shell cartridge from the *Java*.
- A shell cartridge from the *Kortenaer*.
- A valve hand wheel of the *Kortenaer*.
- Wine bottle of the *Java*.

The copper alloy cartridge of the *Java* is 69 cm high and the base has a diameter of 17.5 cm. The numbers and texts on the base correspond with the information mentioned in the dive report of 2016.



Figure 41: The copper alloy cartridge of the *Java*.

The copper alloy cartridge of the *Kortenaer* is 103 cm high and the base diameter is 16 cm. The numbers and texts on the base correspond with the information mentioned in the dive report of 2016.



Figure 42: The copper alloy cartridge of the *Kortenaer*.

The iron valve hand wheel of the *Kortenaer* is corroded and does not contain any details to identify it as specific for Dutch ships or not.



Figure 43: The iron valve hand wheel of the *Kortenaer* (both sides).

The thick green glass bottle has a deep sole. Although we cannot be certain it was originally from the *Java*, we can say it is quite likely from around that period. It is a typical wine bottle moulded with many irregularities in the glass.



Figure 44: Thick green glass bottle from the *Java*.

APPENDIX 4

Specifications of the ships

1. Hr.Ms. De Ruyter

Construction details	
Type	Light cruiser
Class	De Ruyter Class Cruiser
Dockyard	N.V. Wilton Fijenoord in Schiedam (bnr. 652)
Ordered	1 August 1932
Laid down	16 September 1933
Launched	11 May 1935
Commissioned	3 October 1936
Specifications	
Displacement	6442 tons standard, 7822 tons full load
Length	170,8 meters
Width	15,64 meters
Draft	5,1 meters
Crew:	436
Armament	<ul style="list-style-type: none"> - 7x 150 mm (5.9 in) Bofors No. 9 and 10 guns (3x2; 1x1) - 10x 40 mm (1.47 in) Bofors L/60 No. 3 anti-aircraft guns (5x2) - 8x 12.7 mm (0.5 in) Browning machine guns
Fire control system	For main battery and AA one Hazemeyer type each
Aircraft	2 Fokker C 11 W floatplanes with a Heinkel K 8 catapult
Armour details	
Deck	33 mm
Turrets	<ul style="list-style-type: none"> - 33 mm sides - 100 mm front side
Belt	30 – 51 mm
Tower	33 mm
Bulkheads	33 mm
Propulsion details	
Boilers	6 Yarrow boilers
Machinery	3 Parsons geared steam turbines of the 'Koninklijke Maatschappij De Schelde', Vlissingen
Performance	66000 shp (75000 shp for short periods of time)
Max speed	32 knots (59 km/h; 37 mph)
Cruising speed	17 knots
Bunkerage	1300 t oil
Range	6800 nmi (12600 km; 7800 mi) at 12 knots (22 km/h; 14 mph)
Shafts	2

2. Hr.Ms. Java

Construction details	
Type	Light cruiser
Class	Java Class Cruiser
Design	Germaniawerft, Kiel
Dockyard	'Koninklijke Maatschappij De Schelde', Vlissingen (bnr. 165)
Laid down	31 May 1916
Launched	6 August 1921
Commissioned	1 May 1925
Specifications	
Displacement	6670 tons standard, 8078 tons full load
Length	155,3 meters (509 ft 6 in)
Width/beam	16 meters (52 ft 6 in)
Draft/draught	6,22 meters (20 ft 5 in)
Crew:	526 (35 officers, 54 petty officers, 437 men)
Armament	<ul style="list-style-type: none"> - 10x 150 mm (5.9 in) Bofors No. 6 guns (10x1) - 8x 40 mm (1.47 in) Bofors No. 3 anti-aircraft guns (4x2) - 8x 12.7 mm (0.5 in) Browning machine guns
ASW	10-12 depth charges
Fire control system	Hazemeyer
Aircraft	2 Fokker C XI-W floatplanes (with crane)
Other	<ul style="list-style-type: none"> - 1 smoke machine - 36 mines
Armour details	
Deck	<ul style="list-style-type: none"> - 25 mm horizontal - 50 mm (2.0 in) (inclined, connecting deck with belt)
Belt	75 mm (3.0 in)
Conning tower	125 mm (4.9 in)
Shields	100 mm (3.9 in)
Propulsion details	
Boilers	8 Schultz-Thornycroft boilers
Machinery	3 Parsons turbines
Performance	73000 shp
Max speed	31 knots
Bunkerage	<ul style="list-style-type: none"> - 1126 tons (normal) - 1176 tons (max)
Range	<ul style="list-style-type: none"> - 5000 nmi at 12 knots (22 km/h, 14 mph) (design) - 4340 nmi (8040 km, 4990 mi) at 10/11 knots (actual)
Shafts	3

3. Hr.Ms. De Kortenaer

Construction details	
Type	Destroyer
Class	Admiralen-class destroyers
Dockyard	Burgerhout
Laid down	24 August 1925
Launched	30 June 1927
Completed	3 September 1928
Pennants	KN Van Nes
Specifications	
Displacement	1316 tons Washington displacement, 1640 tons full load
Length	98,1 (oa)meters, 93.4 (pp) meters
Width/beam	9,5 meters
Draft/draught	3,0 meters
Crew:	149
Armament	<ul style="list-style-type: none"> - 4x 120 mm (5.9 in) Siderius No. 5 guns (4x1) - 1x 75 mm No. 8 gun - 4x40 mm No. 1 guns - 4x .50 (0.5 in) Browning machine guns
Torpedoes	6 x 53,3 cm (21") torpedo launchers with Whitehead type II S3 torpedoes
ASW	4 depth charge throwers with 12 charges
Other	<ul style="list-style-type: none"> - 1 floatplane - 24 Vickers mines on 2 minerails
Propulsion details	
Boilers	3 Yarrow
Machinery	2 sets of Parsons geared turbines
Performance	31000 shp
Max speed	34 knots
Bunkerage	305 metric tons oil
Range	3300 nmi at 15 knots
Shafts	2