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The Archaeology of First World War U-boat Losses in the English Channel and its Impact on the Historical Record

Innes McCartney

This article examines how the archaeological record of 35 known U-boats sunk in the English Channel in the First World War compares with the assessment of U-boat destructions made by the Admiralty's Antisubmarine Division (ASD) in 1919. Comparison of the two shows that only 48 per cent of the 37 assessments were correct. This divergence between the extant archaeology and the 1919 assessment was partly caused by over optimism at ASD regarding reported attacks. However, it is also observed that ASD's own processes were on occasion overridden by a need to overstate Allied successes, and should be seen in the broader context of a wider range of inefficiencies that confronted the Naval Staff during the First World War. The same mistakes seem entirely absent from the Second World War records in the same geographical area. The research reveals that the radio silence observed by the Flanders flotilla proved a challenge to combating its U-boats at sea, making the tracking of the U-boats and the rerouting of Allied ships practically impossible. This was a factor in the early adoption of 'controlled sailings' in the Channel. It may have also been the driving factor behind the navy's pressure to attack the Flanders bases by land in 1917, a key component often overlooked by historians.

Key words: maritime heritage, Room 40, Naval History, Admiralty, First World War, Naval Intelligence, anti-submarine warfare, Royal Navy, U-boats, battle of Passchendaele, Naval Staff, Flanders flotilla

On 6 June 1944 (D-day) a radio-based position-fixing system known as GEE was switched on to provide accurate navigational capability to the landings in Normandy. Ships using GEE and equipped with ASDIC had the additional benefit of being able to pinpoint the exact locations of shipwrecks in a repeatable manner. This meant that anti-submarine warfare (ASW) forces did not waste time attacking wrecks when hunting U-boats that were entering the English Channel at that time.

The lists of known wrecks compiled in 1944–5 became the basis for what is now the UK Hydrographic Office shipwreck database. Routine hydrographic surveys in the decades that followed greatly improved the quality of data and the number of shipwrecks located, so that by the 1970s the growing number of recreational divers had a ready-made list of wrecks to explore; among them were the U-boats.

In 1997 the author began to collate an archaeological record of lost U-boats by systematically diving on and visually recording each submarine wreck known at that time. By then it had become apparent that the number and distribution of the wrecks were noticeably at variance with the published histories of U-boat losses.

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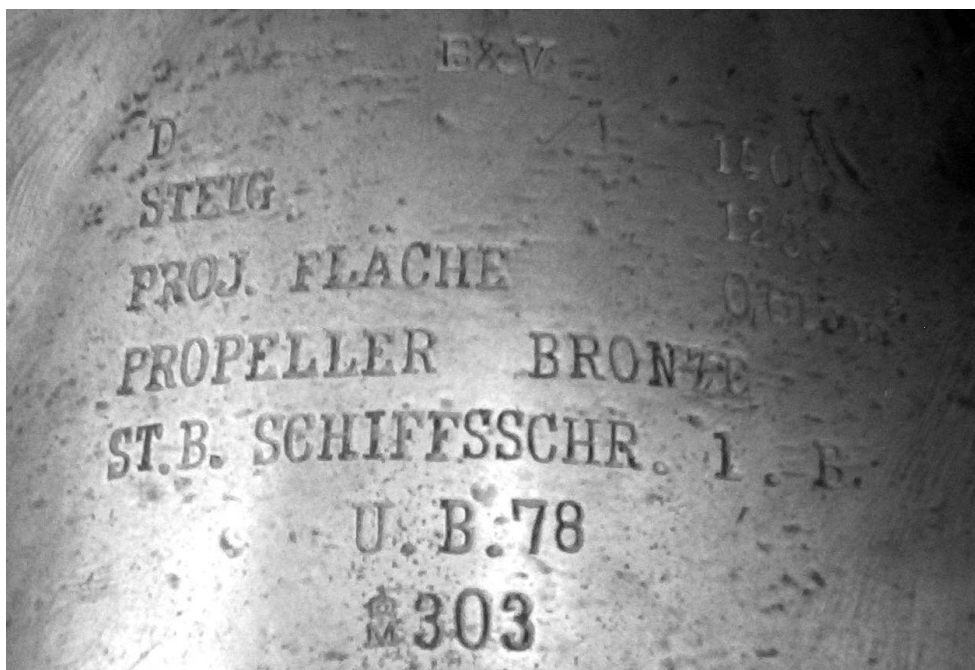


Figure 1 The Blohm & Voss shipyard inscription on one of the propellers of 'UB78', clearly denoting the U-boat on which it was fitted; nearly all U-boats from the First World War can be identified from such inscriptions. (Author's photograph)

Some examples of wartime sinkings yielded survivors, enabling both loss and identity to be confirmed, and these indeed were located where the published record placed them. However, alongside these cases were wrecks with no apparent relationship to the published record. These sites, termed 'mystery cases', were the most difficult to resolve. However, the process of identifying each mystery case was assisted by the fact that the builders of the U-boats provided crucial identifying data on the propellers. These data could be read in situ, providing an instant means of accurate identification, so long as the propellers were original and not substituted during the U-boat's operational life.

In some cases the propellers had previously been recovered and had to be traced. Figure 1 shows one of *UB78*'s propellers on display at the Deutsches Marine-museum, Wilhelmshaven. *UB78* is an example of a mystery case, identified by recreational divers in the area of the Dover minefield, but listed by the Admiralty in 1919 as having been sunk off Cherbourg.¹

The 33 surviving First World War U-boat wrecks in the English Channel area represent the largest single group within the confirmed 87 U-boats present overall. Two additional First World War losses (*UB26*, which was salvaged, and *UC61* which was blown up on a beach) were discounted as dive targets. Of the rest there are 31 Second World War U-boat wrecks and a further 23 wrecks which represent surrendered U-boats from the First World War either sunk as targets, lost in tow or

¹ The National Archives, Kew (hereafter TNA): ADM 239/26, Reported destruction of submarines Aug. 1914 to Jan. 1919.

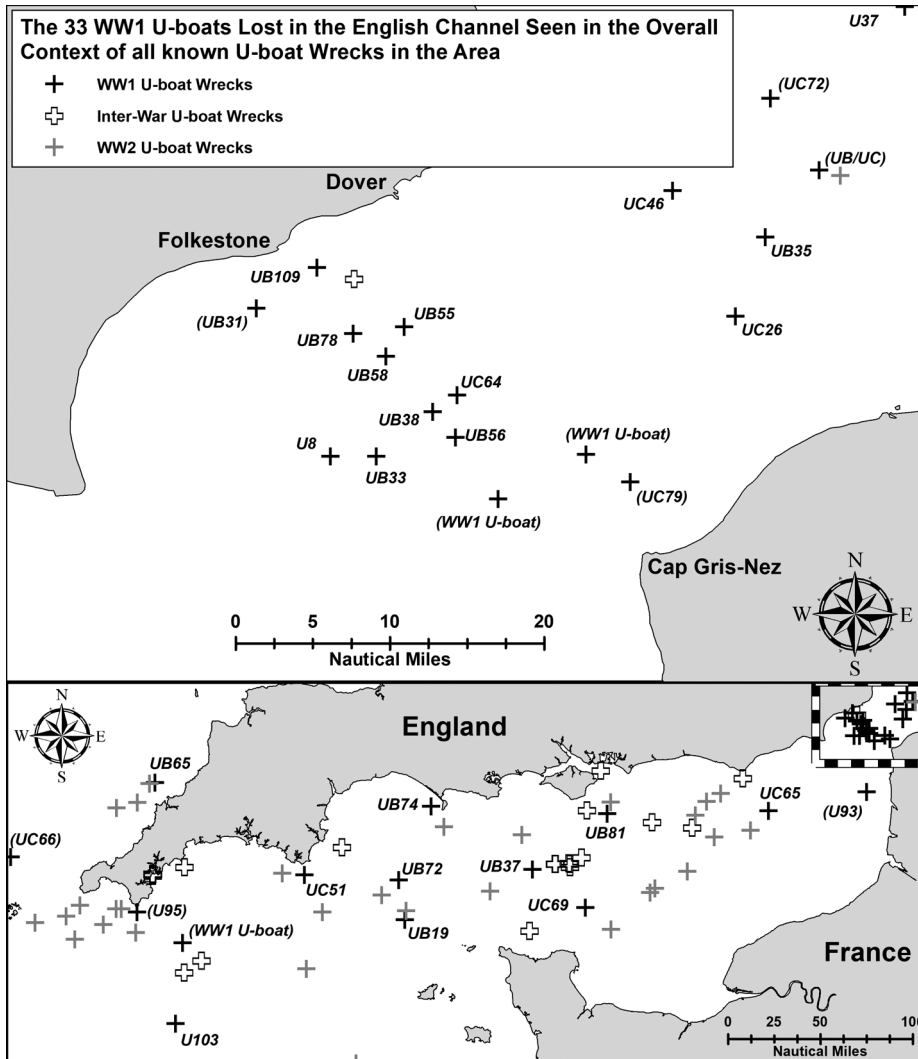


Figure 2 The locations of the 33 First World War U-boat wrecks still lying in the English Channel as seen against the total number of U-boats present. (Author's drawing)

dumped at sea during 1919–21. Some of the isolated cases from this group were examined to confirm their elimination as potential war losses, although the main documented dumping areas were not examined. The overall picture of U-boat wrecks as now known is shown in figure 2.

The last U-boat wrecks to be uncovered by UK hydrographic survey were three on the north coast of Cornwall found in 2001. The final U-boat identifications made by the author took place in 2013 and there has been no pressing need carry out further work since. Only one known wartime loss (*U672* from 1944) remains unfound, although some of the U-boats sunk in the 1921 dumping grounds await positive identification. The sites listed in parentheses are those not yet unquestionably identified to standards of the Admiralty's Antisubmarine Division (ASD), as

described below. For example, the two First World War U-boat cases off Gris Nez are subject to a local diving ban in force in the shipping lane under which they lie. This is also the case for a UB/UC boat lying to the north-east of them. The other identifications in parentheses are more robust and are unlikely to substantively alter. Each wreck has been described in *The Maritime Archaeology of a Modern Conflict*, published in 2014.² The fact that little has changed in the five years since publication shows that the overall archaeological record of U-boat wrecks in the English Channel seems now quite stable and only limited site-specific alterations are likely to occur in the future.

Where archaeology and history diverge: the overall accuracy of the 1919 list

The final edition of the ASD's *Reported Destruction of Submarines* published in January 1919 (hereafter referred to as the '1919 list') presented its appreciation of where all of the 178 U-boats lost in First World War were destroyed.³ In its original version, the 1919 list shows what ASD knew during wartime of the destruction of each U-boat.

By comparing the 1919 list with the archaeological record as known today (the '2018 list'), it was anticipated that the differences uncovered would help to open up a new area of research, which would highlight the challenges faced by ASD in prosecuting the anti-U-boat effort. It would also allow for an evaluation of its successes and failures. A series of maps in figures 3–5 illustrate the differences between the 1919 and 2018 lists. Figure 6 draws together the results into an overall picture.

Figure 3 shows the cases where the two lists match. This shows the degree of convergence between the two datasets: the 1919 list states that 37 U-boats sunk in the English Channel. Of these cases, only 20 can be matched to the 2018 list and a further two cases (*UC61* and *UB26*) are known to have been sunk and subsequently salvaged or dispersed. Thus, measured against its own list, ASD was 59 per cent accurate (22 cases out of 37) in assessing the correct fates of the U-boats destroyed in the Channel in First World War.

More instructive from the research standpoint was the extent to which the two lists do not coalesce. The degree of divergence between the datasets is shown in two ways. First, there are cases where a U-boat was not actually sunk or a where a sunk U-boat was misidentified in the 1919 list. These cases are shown in figure 4. This represents the balance of 15 cases from the 37 that ASD listed as destroyed in the Channel, minus the matching 22 wrecks. In these 15 cases, only in two instances did ASD correctly assess that a U-boat had been destroyed, but even in these cases, it was unable to specifically identify it: ASD mistook *U95* for *U93* and *UC51* for *UB18*.

Of the 13 remaining cases where no U-boat wreck is present at the location given by ASD, it should be noted that two of the U-boats (*UC66* and *UB78*) have been found elsewhere in the English Channel, as shown in figure 2. The actual fates of the other 11 are described in *The Maritime Archaeology of a Modern Conflict*.⁴ However, in all cases it is now clear that the assessments made in wartime were flawed in some way and that the true fates of each U-boat had been overlooked. When looking at the

2 McCartney, *The Maritime Archaeology of a Modern Conflict*.

3 TNA: ADM 239/26. See McCartney, 'Paying the Prize', 40–57, for a description of how this list was compiled, and a summary table of the final list.

4 McCartney, *The Maritime Archaeology of a Modern Conflict*, 135–6.

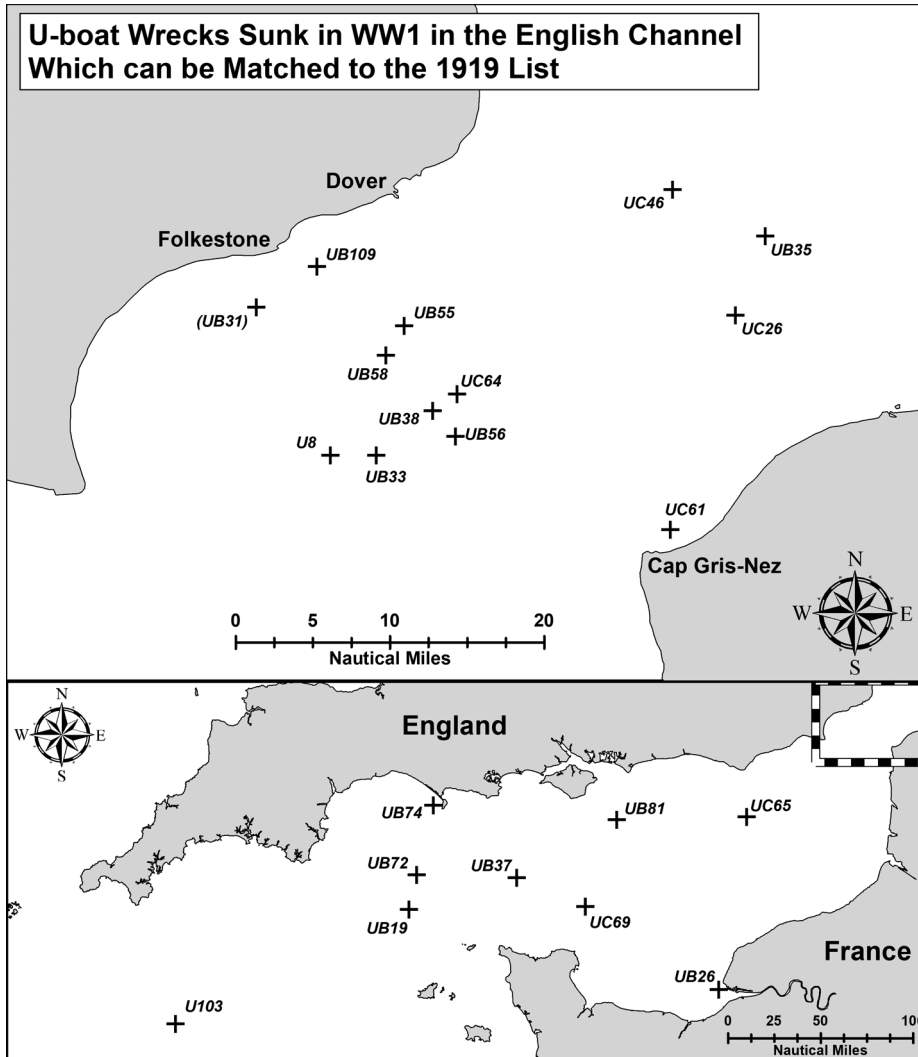


Figure 3 The 22 U-boat wrecks in the English Channel that match cases published in the 1919 list. (Author's drawing)

overall accuracy of ASD's work, it could be argued that actual identity was not important to them, so long as it was known that the U-boat was destroyed. Therefore, adding the two misidentified losses to the 22 correct cases brings the overall accuracy rate up to 65 per cent (24 cases out of 37). Nevertheless, this is still far from an accurate picture of events, even when ASD's performance is measured only against the baseline of its own list. The presence of an additional 11 mystery sites in the 2018 list reduces the accuracy yet further, as shown in figure 5.

Adding the 22 known wrecks, the pair of salvaged cases and the 11 mystery sites brings the total of verified U-boat wrecks in the 2018 list to 35. Drawing these together with the 13 incorrect assessments leads to the final map shown in figure 6. It reveals that there are a total of 48 data points (i.e. alleged plus actual sinking sites). In order to

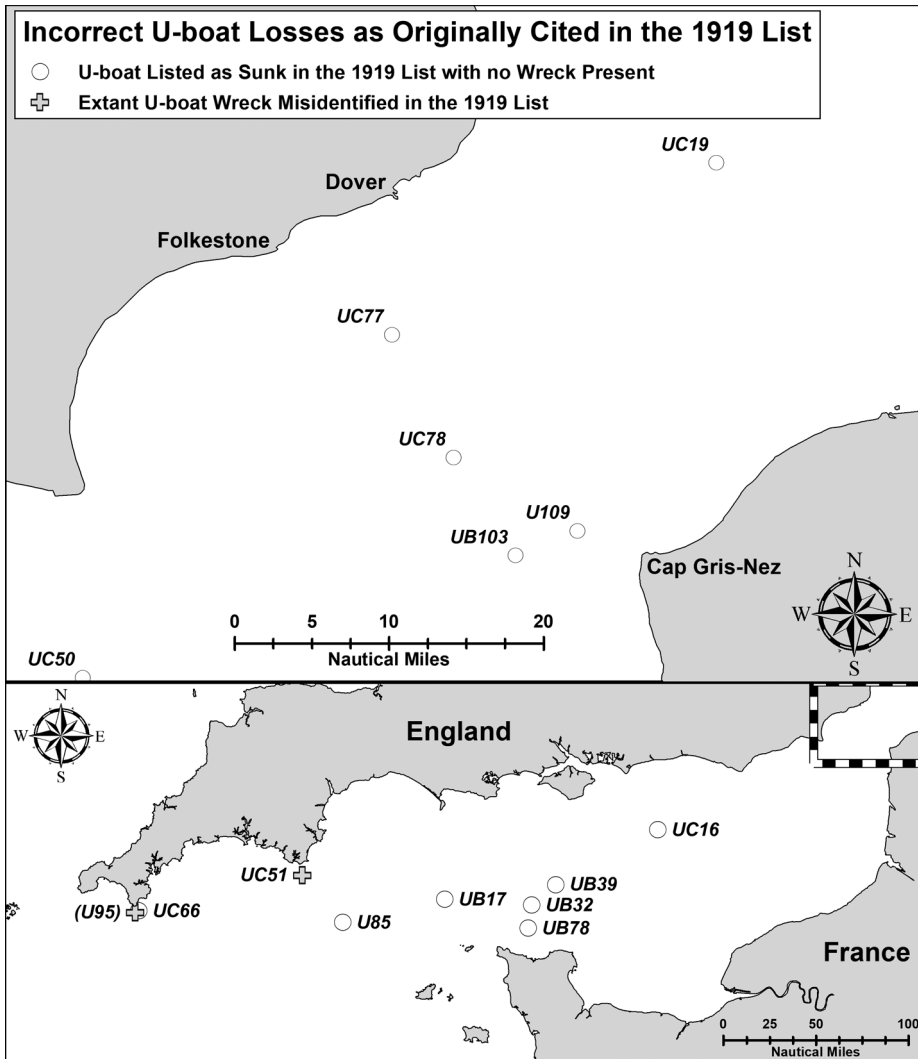


Figure 4 The 15 cases where the 1919 list does not conform to the archaeological record. In two of these cases, ASD correctly identified that a U-boat had been destroyed, but misidentified it. (Author's drawing)

derive an overall accuracy rate it was important not to double count fates, so *UC66* and *UB78* are only counted once, this brings the total number of cases to 46, of which, as shown in figure 3, only 22 were correct. This leads to an overall accuracy rate of 48 per cent. Therefore, in the English Channel, despite its best efforts, ASD was only able to accurately pinpoint the destruction of U-boats in less than half of the cases known today. This was one of the more surprising outcomes of the years of diving and recording the wreck sites, and the rest of this article will examine its implications.

The means of destruction

The 2018 list shows how the U-boats in the channel were actually destroyed, as

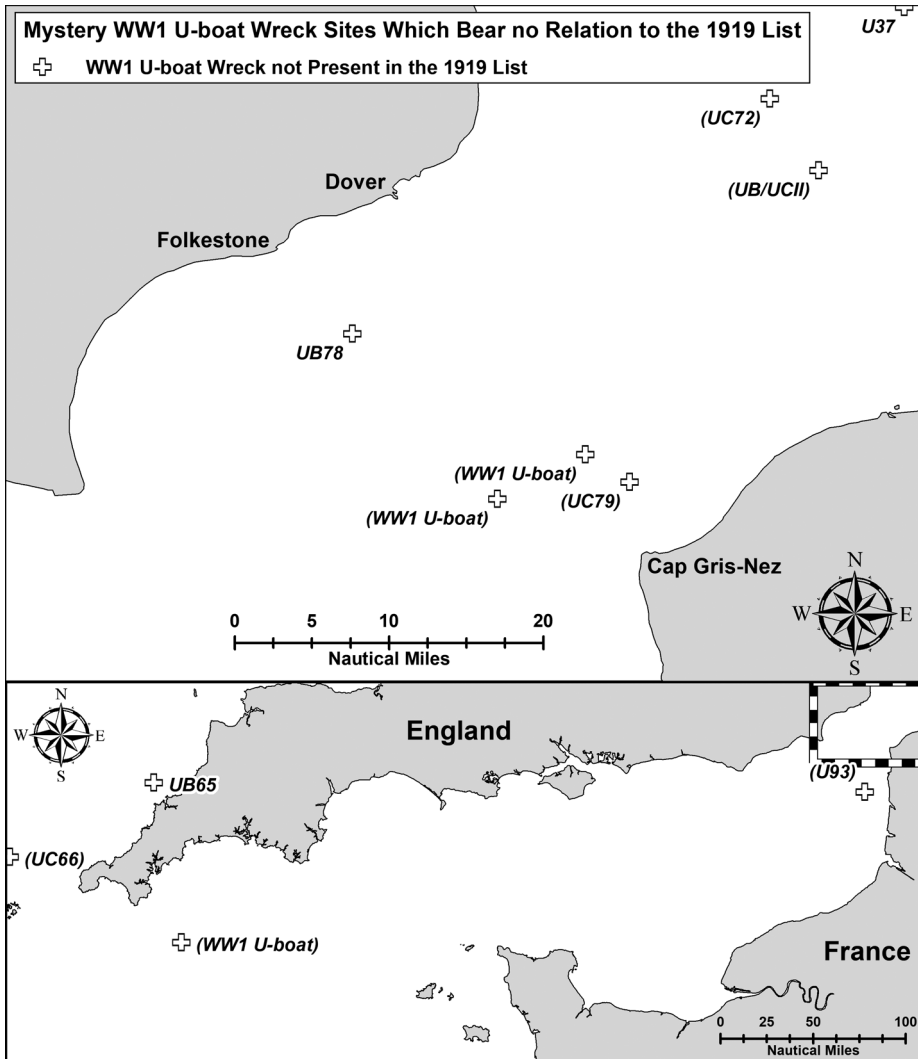


Figure 5 The 11 mystery U-boats in the Channel area which bear no relation to the 1919 list fundamentally affecting its accuracy and raising questions as to why these losses seemingly went unnoticed. (Author's drawing)

opposed to what the assessors believed in 1919. Both the 1919 list and the similar list covering Second World War U-boat losses, the 1946 list,⁵ both share a common fault in the fact that the compilers of both lists attempted to find within their own records explanations for the loss of every U-boat. They did not take into consideration the possibility of losses which would not have been witnessed, such as diving accidents and U-boats striking mines.

A pair of pie charts in figure 7 depict the differences between the 1919 and 2018

5 TNA: ADM 199/1789, Director of Torpedo, Antisubmarine and Mine Warfare Division: U-boats sunk or damaged and US Fleet Antisubmarine Bulletins.

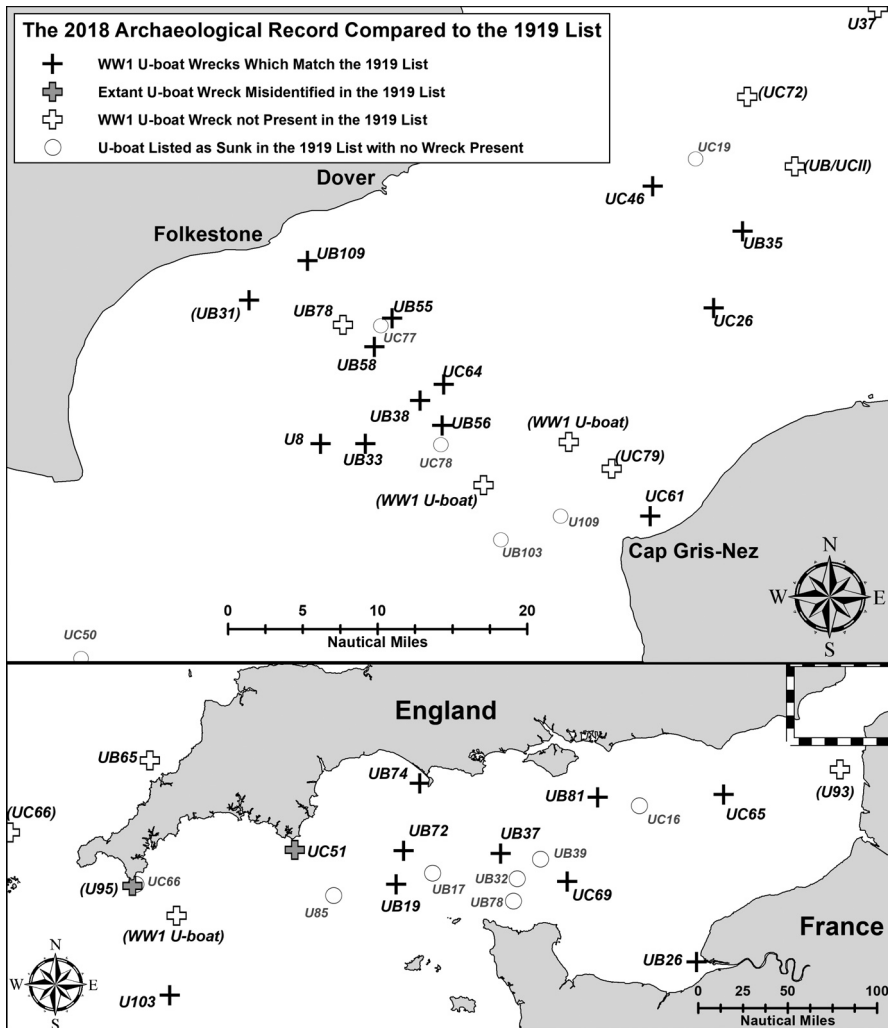


Figure 6 The overall picture of U-boat losses in the Channel in First World War shows that there are 22 correct cases, 11 mystery sites, 11 incorrect cases and 2 misidentified cases. The 1919 list is only 48 per cent correct. (Author's drawing)

lists when looking specifically at the means of destruction. Immediately noticeable is the increased proportion of U-boats destroyed by mines, represented by there being two more U-boats lost in the Dover barrage than the 1919 list described. The numbers of U-boats actually destroyed by depth-charges, ramming and Q-ships are reduced, and the losses by unknown cause increases from zero to 11 per cent, accounted for by the fact that there is no currently known explanation for the loss of four of the mystery U-boat wrecks.

The English Channel is atypical as a theatre of U-boat operations. The presence of the Dover minefield leads to a higher rate of loss to mines than elsewhere: in 1973 the Admiralty calculated that overall around 30 per cent of U-boats sunk in the First

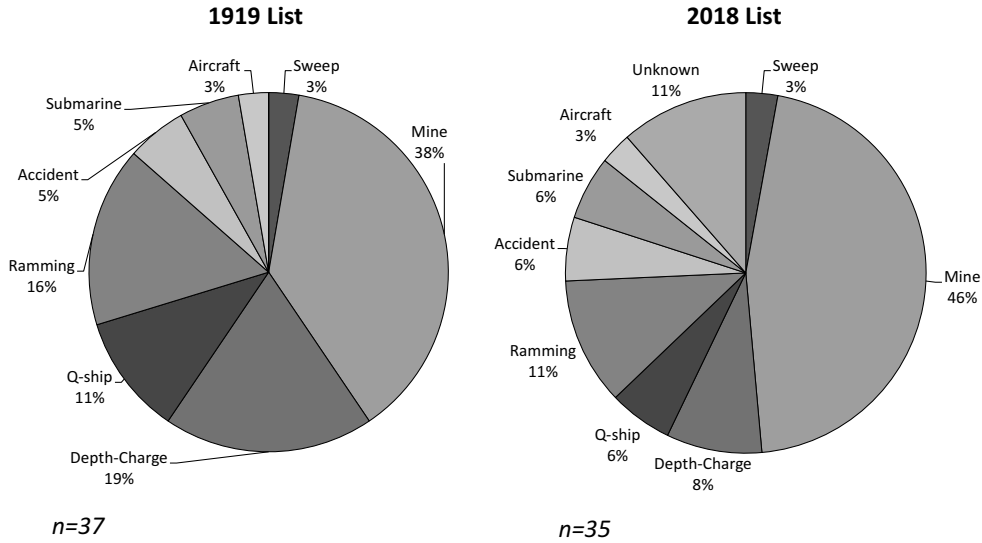


Figure 7 The actual means of destruction of the U-boats compared to the estimations made by ASD in the 1919 list; minefields produced even better results than originally presumed. (Author’s drawings)

World War were mined.⁶ Additional U-boat wrecks found in minefields elsewhere in recent years, such as the Northern Barrage, leads to slight adjustment upwards of this figure, but the overall impact is not anticipated to reach the 44 per cent seen in the English Channel.

Flaws in the system: errors made by the ASD in assessing U-boat losses

The ASD was founded in November 1916 under the command of Rear-Admiral Duff. Its formation was one of a number of initiatives that coincided with the appointment of Admiral Jellicoe as First Sea Lord and was a direct response to the anticipated outright attack on shipping by the U-boats, which began in February 1917. ASD’s role was to coordinate all efforts aimed at defeating this threat, including assessing how the U-boats were being destroyed. In May 1917 reforms within the Admiralty War Staff (now called the Naval Staff) led to Room 40 (now called ID25) being brought within the Naval Intelligence Division (NID). This allowed for closer working arrangements with the Direction Finding (DF) and Convoy and Tracking sections, leading to a precursor of the Operational Intelligence Centre (OIC) of the Second World War.⁷

Reports and digests by the Naval Staff, NID and ASD, written from mid-1917 onwards, clearly show that data compiled earlier in the war was reworked into a format consistent with new work. Thus, the 1919 list presents all ASW incidents from 1914 onwards as subject to a common assessment procedure and format. The

6 Naval Historical Branch, Portsmouth (hereafter NHB), Ministry of Defence, Directorate of Naval Warfare, 1973. British Mining Operations 1939–1945, vol. 1. Naval Staff History BR1736 (56) (1), 41.

7 Beesly, *Room 40*, 173–7.

assessment procedure itself was described in the Technical History Section of the Admiralty's (THSA) history of ASD.

Every engagement reported came under one of five headings. If considered to be of no value it was recorded as . . . 'Not classified'. If the submarine was considered to have been 'Possibly slightly damaged' the successful result was regarded as 'Improbable'; if 'Probably seriously damaged', 'Possible'; and if 'Probably sunk', 'Probable'. Where the destruction was definitely established, the result was logged as 'Known'. As experience showed . . . the classifications arrived at were often regarded in the Fleet, and by the persons most intimately concerned, as being unduly pessimistic.⁸

The classification of losses as described was still in use, with minor changes in definition, in 1945. A letter grade was added to each heading; so that 'Known' was 'A', 'Probable' was 'B', 'Possible' was 'C', 'Improbable' was 'D' and 'Not Classified' was 'E'. Therefore, every U-boat destroyed in both world wars was subject to these assessment criteria. Some insight into the actual working of decision-making process was also given in the technical history.

The classification of the result of any engagement other than a 'Certainty' was extremely difficult, and conclusions were only definitely arrived at after a studied survey of each case, taking into consideration former and subsequent enemy movements in the vicinity, in conjunction with the knowledge possessed of the numbers and disposition of the submarines out at the time. For instance, a most helpful case was discountenanced by the fact that trustworthy intelligence gave one submarine only in the vicinity, and yet enemy activity continued after the attack in the same area. It was well known too, that the enemy put into practice various ruses – such as discharging oil into the water – to mislead and upset the calculations of the attacking vessel.⁹

This paragraph is revealing because it shows that in practice the assessors struggled to judge with accuracy anything other than a certain 'A' grade kill. It also shows that the assessors had access to 'trustworthy intelligence' from NID on the actual disposition of U-boats as derived, from ID25, DF and the Tracking section. The original assessments made in each case survive in the quarterly editions of ASD's *Submarine Losses Return*.¹⁰ However, when the 1919 list was published, all the losses were considered 'A' – known sunk. Table 1 shows the losses as originally assessed in the returns.

As table 1 shows, it is quite clear that in at least ten of the 46 cases shown in figure 6, ASD carried out assessments into the losses of the U-boats in disregard to its own published processes. Cases where the process was seemingly not followed are shown in bold and, in these cases, the letter in brackets is the author's assessment of the classification that should have been given at the time, based on ASDs own rules.

There was a survivor from *UB56*, identifying the U-boat, so it should certainly

8 NHB, Technical History Section Admiralty, 1919. The Antisubmarine Division of the Naval Staff Dec. 1916–Nov. 1918. CB1515 (7), 6.

9 Ibid.

10 CBo1292 in TNA: ADM 239/26

have been classified 'A'; Admiralty divers also searched the wreck in 1918.¹¹ There was, however, no evidential basis in the returns for the grading given in the cases of *UB37*, *UC46* and *UB31*, as no survivors or verifiable surface evidence was found.

Far more surprising are the six inaccurate cases where quite clearly, the 'A', known sunk, attribution should not have been made. The two cases marked with an asterisk are the pair shown in figure 4 as having been misidentified when sunk. The evidence was only circumstantial, and 'B' would have been a better assessment. Three other cases were made solely on oil being present in the water and so by its own criteria, these 'A' classifications should not have been made. They are particularly notable when taking into consideration that, as previously noted, ASD considered that the presence of oil could be a ruse. Consequently, these cases are worth examining in more detail.

UB78. The assertion that it was sunk on 9 May 1918 by ramming off Cherbourg,¹² which only produced an oil patch, was made based on interrogations from survivors of other U-boats which stated *UB78* had not returned from a patrol.¹³ Thus, in fact all that was known was that the U-boat had disappeared somewhere. The wreck was found in the Dover minefield in the 1980s by recreational divers.

UC77. The assertion that this U-boat was destroyed on 10 July 1918 by depth-charges,¹⁴ producing oil, was, according to the Room 40 History Sheet for the boat,¹⁵ based on no intelligence whatsoever. Nothing of the U-boat's movements was known at the time. In fact, *UC77* was in harbour on the 10th, and only sailed the following day.¹⁶

U109. This U-boat was listed as mined in the Dover Barrage on 26 January 1918.¹⁷ There was no evidence aside from the fact that a U-boat was seen on the surface and oil was seen after an explosion to support this claim.

Finally, the case of *UC79* raises a number of important points. The attack in the southern North Sea by the submarine *HMS E45* on 19 October 1917, credited in the 1919 list with sinking this U-boat, was based on the evidence of only 'a great upheaval of water'.¹⁸ However, it is interesting to note that, from the Room 40 History Sheet for *UC79*, it had sent a radio transmission, fixed by DF at a position close to *E45*'s attack,¹⁹ which must have been the reason for attributing its destruction to *E45*, although this is not actually stated by ASD.

Problematically for ASD, Room 40 was still collecting operational intelligence on

11 McCartney "The "Tin Openers"", 22

12 TNA: ADM 239/26.

13 TNA: ADM 137/3917, Original history sheets of UB type German submarines, *UB74-UB155*.

14 TNA: ADM 239/26.

15 TNA: ADM 137/3918, Original history sheets of UC type German submarines, *UC1-UC105*.

16 Spindler, *Der Handelskrieg mit U-Booten*, vol. 5, 103.

17 TNA: ADM 239/26.

18 Ibid.

19 TNA: ADM 137/3918.

Table 1 The grading made for each U-boat destroyed according to the 1919 list

<i>Accurate losses</i>	<i>Letter grade</i>	<i>Survivors?</i>	<i>Inaccurate losses</i>	<i>Letter grade</i>	<i>Survivors?</i>
U8	A	Yes	UC19	B	No
UB26	A	Yes	U85	B	No
UB19	A	Yes	UB39	B	No
UB37	A (B)	No	(UC66)	B	No
UC46	A (B)	No	UB32	B	No
UC26	A	Yes	UC16	B	No
UC61	A	Yes	UC51	A (B)*	No
UC65	A	Yes	(U95)	A (B)*	No
UB81	A	Yes	U109	A (C)	No
UC69	Not listed	Yes	UC50	B	No
UB56	B (A)	Yes	UB17	B	No
UB35	A	Yes	UB78	A (C)	No
UB38	B	No	UC78	B	No
UB58	A	No	UC77	A (C)	No
UB33	A	No	UB103	Unclassified	No
UB55	A	Yes	U37	not listed	No
(UB31)	B (C)	No	(U93)	not listed	No
U103	A	Yes	(UC79)	A (C)	No
UB72	A	Yes	UB65	B	No
UB74	A	Yes	(WW1 U-boat)	not listed	No
UC64	B	No	(UC72)	not listed	No
UB109	A	Yes	(UB/UCII)	not listed	No
			(Submarine)	not listed	No
			(WW1 U-boat)	not listed	No

The grades in brackets have been added by the author as the suggested grade which should have been given, based on the actual contemporary evidence

it until it disappeared in the spring of 1918. A wreck found by Admiralty divers in August in the Dover minefield was identified as UC79,²⁰ but no attempt was made to correct the Returns and ‘resurrect’ the U-boat. It had been declared dead in October 1917 and ASD simply ignored any evidence to the contrary. As the Room 40 intelligence officer William F. Clarke later recalled,

The Anti-Submarine Division . . . had frequently to boost their own efforts, insisted on the success of many attacks that we in Room 40 knew to have been abortive and many officers had received decorations in consequence.²¹

In the light of this observation, the attribution of ‘A’ grade cases such as UB78, UC77, U109 and UC79 are seen as much as poor staff work as attempts by ASD to ‘boost their own efforts’; to demonstrate a degree of efficiency, which was in fact greater than it was achieving in wartime. The desire to demonstrate efficiency was not limited simply to ASD.

²⁰ McCartney, *The Maritime Archaeology of a Modern Conflict*, 73–5.

²¹ TNA: HW 3/16, W. F. Clarke, History of GCCS and its Naval Section, 1919–1945.

Tensions with the fleet

As described in the history of ASD above, there was a tension between ASD's assessment of losses and that of the Fleet.²² Evidence for this was uncovered during the research when a spatial database of ASW incidents was compiled in GIS from the quarterly returns of ASD,²³ the diaries of the Dover Command,²⁴ the records of the Admiralty Salvage section pertaining to diving on the U-boat wrecks,²⁵ and the actual location of each line of mines at Dover.²⁶ The results are shown in figure 8.

Of particular note is the disparity between the ASW incidents recorded by ASD in its Returns when compared to the Dover Command. Where one would expect the Dover Command to have been reporting incidents directly to ASD, it seems as if in reality both were compiling separate records from differing sources. There is little correlation between the two and the reason why is difficult to explain, aside from the degree of rivalry that the 'Technical History' seems to suggest.

For example, in his autobiography, Admiral Keyes claimed that a U-boat was destroyed at the location where the mystery *UB78* lies.²⁷ In this case, he seems to have been right (although he got the identity wrong) and ASD wrong. Nevertheless, this is not consistently the case and Keyes made mistakes. One of the more notable arose from the reports from Admiralty divers (presumably confused by bad underwater conditions) that there were two U-boats side by side at the location where only one (*UB58*) exists. Keyes paid out two sets of prize money, although ASD was not convinced. Poor record keeping was also seen in the records of the Admiralty divers: inexplicably, as shown in figure 8, they appear to have made dives on the wreck of *UB55* in July and again in August 1918 without realizing it was the same wreck.

Flaws in the system: conclusions

It is axiomatic that duplication of effort, administrative overlaps, interdepartmental rivalry and fictitious statistics are unhelpful in the successful prosecution of industrial-based wars of attrition. Nevertheless, there is plenty of evidence to show the Naval Staff struggled to address these challenges in 1917-18. For example, the industrialist Sir Eric Geddes, while Controller of the Navy, was deliberately supplied with made up statistics to work on.²⁸ The Plans Division and ASD failed to cooperate in planning ASW strategy for 1918, both independently producing papers with no co-operation, leading Admiral Beatty to be 'simply astonished that such a procedure should be possible'.²⁹ It is therefore important to see the failures of process in the accurate recording of U-boat losses in the broader context of the wide range of processual and organizational challenges faced by the Naval Staff at this

22 NHB, Technical History Section Admiralty, 1919. The Antisubmarine Division of the Naval Staff December 1916–November 1918. C.B.1515 (7), 6.

23 CB01292 in TNA: ADM 239/26.

24 TNA: ADM 137/2096, Dover Patrol Operations Packs, vol. 3, pack 46/3, and ADM 137/2097, Dover Patrol Operations Packs, vol. 4, pack 46/3 continued.

25 TNA: ADM 116/1851, Salvage record no. 22, and TNA: ADM 116/1632, Salvage record no. 20.

26 Leith 'History of British Minefields'.

27 Keyes, *The Naval Memoirs*, vol. 2, 260.

28 Grieves, *Sir Eric Geddes*, 41-2.

29 Marder, *From the Dreadnought to Scapa Flow*, vol. 5, 316.

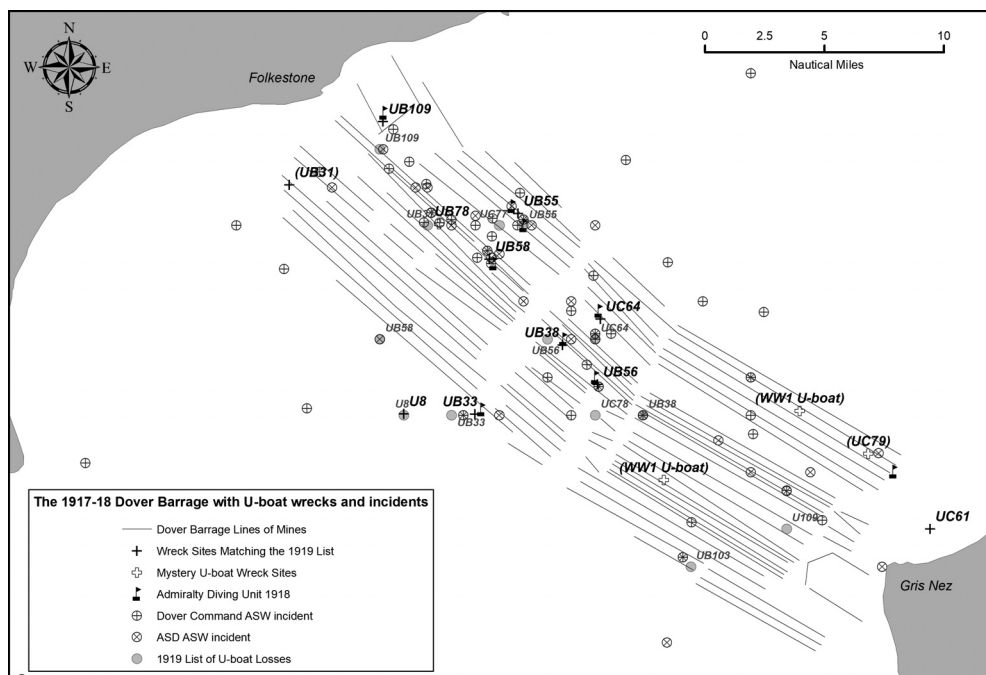


Figure 8 U-boat wrecks and incidents in the Dover Barrage, showing the disparity between the records of the Dover Command and ASD and the sites visited by the Special Section divers in 1918. (Author's drawing)

time, exacerbated by a shortage of trained staff officers.

The temptation to overstate successes against U-boats re-emerged in March 1940. In this instance Churchill, First Lord of the Admiralty, publicly claimed that only 12 U-boats remained in service, and in 'an act of cruel injustice' demanded the sacking of Captain A. G. Talbot, Director of Anti-Submarine Warfare (and head of the Assessment Committee) whose accurate statistics, based on the empirical methodology developed by ASD (and now followed in a non-arbitrary manner) revealed that 43 U-boats remained in service.³⁰ This estimate was accurate and Churchill's claims echo ASD's boosting of its efforts in 1919.

The research in to the 31 U-boats sunk in the English Channel during the Second World War shown in figure 2 followed the same methodology as was used to analyse the accuracy of the 1919 list. The results clearly show that there were no procedural anomalies in the assessments of U-boats sunk. In marked contrast with the 1919 list, all the cases assessed according to the rules means that that the 'A' Known Sunk cases are all provably correct.

The Flanders flotilla and the road to Passchendaele

There is no doubt that ASD relied as much as it could on signals intelligence derived from the radio transmissions from and to U-boats at sea. The U-boats that operated from the High Seas Fleet bases routinely used their radios and valuable intelligence

³⁰ Roskill, *Churchill and the Admirals*, 94.

Table 2 The extent of DF available on the movements of U-boats lost in the English Channel

<i>Accurate losses</i>	<i>Based</i>	<i>DF at time of loss</i>	<i>Inaccurate losses</i>	<i>Based</i>	<i>DF at time of loss</i>
<i>U8</i>	Flanders	No	<i>UC19</i>	Flanders	No
<i>UB26</i>	Flanders	No	<i>U85</i>	Germany	No
<i>UB19</i>	Flanders	No	<i>UB39</i>	Flanders	No
<i>UB37</i>	Flanders	No	(<i>UC66</i>)	Flanders	No
<i>UC46</i>	Flanders	No	<i>UB32</i>	Flanders	No
<i>UC26</i>	Flanders	No	<i>UC16</i>	Flanders	No
<i>UC61</i>	Flanders	No	<i>UC51</i>	Flanders	No
<i>UC65</i>	Flanders	Yes [†]	(<i>U95</i>)	Germany	No
<i>UB81</i>	Flanders	No	<i>U109</i>	Germany	No
<i>UC69</i>	Flanders	No	<i>UC50</i>	Flanders	No
<i>UB56</i>	Flanders	No	<i>UB17</i>	Flanders	No
<i>UB35</i>	Flanders	Possibly	<i>UB78</i>	Flanders	No
<i>UB38</i>	Flanders	No	<i>UC78</i>	Flanders	No
<i>UB58</i>	Flanders	No	<i>UC77</i>	Flanders	No
<i>UB33</i>	Flanders	No	<i>UB103</i>	Flanders	No
<i>UB55</i>	Flanders	No	<i>U37</i>	Germany	No
(<i>UB31</i>)	Flanders	No	(<i>U93</i>)	Germany	No
<i>U103</i>	Germany	Yes [§]	(<i>UC79</i>)	Flanders	No [‡]
<i>UB72</i>	Germany	Yes [†]	<i>UB65</i>	Germany	Yes [*]
<i>UB74</i>	Flanders	No	(WW1 U-boat)	N/A	N/A
<i>UC64</i>	Flanders	No	(<i>UC72</i>)	Flanders	No
<i>UB109</i>	Flanders	Yes [¶]	(<i>UB/UC11</i>)	N/A	N/A
			(Submarine)	N/A	N/A
			(WW1 U-boat)	N/A	N/A

* *UB65* sent its last radio signal on 4 July and was lost six days later

† Sunk as a direct result of DF intelligence

‡ The wrong attribution to *UC79*'s destruction shows DF available at that time

§ A radio message from *U103* was picked up 48 hours before she was sunk

¶ *UB109* was on an experimental long-range patrol to the Azores

flowed in via Room 40 and the DF Section as a result. It is important to observe that two of the U-boats destroyed in the Channel, *UB72* and *UC65*, were sunk by British submarines vectored to the locations of the U-boats derived from DF.³¹ The problem in the English Channel was that radio-derived intelligence was otherwise practically non-existent.

Table 2 shows the extent to which radio intelligence in the form of DF was available at the time a given U-boat was destroyed. It shows that in only five cases did DF play a role in the destruction of a U-boat. In every other case, aside from the misattribution of the loss of *UC79* to HMS *E45*, previously described, the airwaves were dead and no signals intelligence was available.

The primary reason for this intelligence blind spot in the English Channel was the Flanders flotilla. The flotilla was established in 1915 and its main area of operations was the southern North Sea, English Channel and Bay of Biscay. It operated small

31 McCartney, *The Maritime Archaeology of a Modern Conflict*, 93–5, 100–1.

numbers of the UB-type coastal boats and the UC-type minelayers. From its outset, due to its operating from foreign soil it maintained radio silence, as described in the Room 40 history of the German navy,

In somewhat marked contrast to their custom at the North Sea Bases the German authorities observed considerable secrecy as to naval movements on the Flanders coast. In particular, the greatest restrictions in the use of wireless were enforced. The Flanders boats when at sea were consistently silent and unlike their comrades of the Bight Flotillas, refrained from reporting their positions or the results of their cruises by wireless . . . The effect of this secrecy is to reduce the amount of first-hand evidence as regards details of cruises to within small limits while evidence of survivors or prisoners is only reliable to a less degree. Under these circumstances, it has seemed best to write the history of the flotilla in the form of a general review of submarine operations on the Flanders coast.³²

Owing to this maintenance of radio silence by boats from Flanders, often the first that was known of their movements was when ships began to disappear. In the confined waters of the English Channel, there was no possibility of routing vessels away from danger and there was little opportunity to attempt to chase them off without accurate data from DF. The early adoption of the convoy system in the English Channel, under the guise of 'Controlled Sailings' in February 1917, several months before the broader convoy system was adopted was, in part, a response to the apparently-unending losses of colliers to the U-boats of the Flanders flotilla. As table 3 shows, the losses in the last quarter of 1916 to the Flanders flotilla were particularly severe, with France heavily reliant on British coal.³³

The role radio silence played in the Flanders flotilla's successes is often overlooked by historians. A modern detailed study of the relationship between the Royal Navy and Passchendaele appears not to mention it.³⁴ Stephen Roskill also seems not to have recognized its significance, even in a strongly worded critique of the navy's role in pressing for the 1917 Flanders land offensive. Writing in the *RUSI Journal* in 1959, he was critical of the navy's pressure on the Army to bring about a land attack on the Flanders bases in 1917. He concluded that

had we then possessed an Inter-Service planning authority, it is difficult to believe that the fallacies here discussed would not have been exposed in time to avoid what may be considered errors of some magnitude – the price of which was paid by the British Army.³⁵

Among the alleged fallacies he dismissed was the idea that any material benefit would derive from driving the U-boats out of Flanders, arguing that the flotilla could have operated from Germany with the same results.³⁶ Clearly, this is not the case: such a move would have caused it to revert to High Seas Fleet radio practices, which would produce greater signals intelligence through decryption and DF, and have facilitated the tracking and active hunting of its boats and the rerouting of Allied ships.

32 Birch and Clarke, 'A Contribution to the History of German Naval Warfare', 316–7.

33 Halpern, *A Naval History of World War 1*, 351–2.

34 Wiest, *Passchendaele and the Royal Navy*.

35 Roskill, 'The U-boat Campaign of 1917', 442.

36 *Ibid.*, 441.

Roskill goes on to claim that, had the convoy system been promptly introduced, 'Jellicoe's pessimistic prognostications made to the War Committee and Haig – that we would lose the war unless Ostend and Zeebrugge were captured – would surely never have been uttered'.³⁷ He omits to mention that controlled sailings were already in place in the Channel when the attack on shipping of February 1917 got under way. As table 3 shows, the Flanders flotilla was sinking more ships in the first quarter of 1917 than in the last quarter of 1916, despite the introduction of controlled sailings. One has to wonder what else the Admiralty could have done at that time.

Roskill was selective in the statistics he chose to use.³⁸ He claimed that the Flanders flotilla were responsible for a third of the losses in February to May 1917, based on Spindler's summaries for the tonnages sunk for that period.³⁹ Oddly, however, Roskill neglected the losses to U-boat mines and used only the tonnages of ships torpedoed. Table 3 shows the actual losses of ships through this period by all causes. It clearly shows that in fact the Flanders flotilla sank 549 ships, fully 46 per cent of the total, making them far more dangerous than Roskill may have presumed. As table 3 shows, during 1916–18, the Flanders flotilla sunk 48 per cent of the overall total of its efforts and those of the High Seas Fleet boats combined.

In reality the early adoption of convoys in the English Channel could not on its own have stemmed the losses of ships caused by Flanders-based U-boats. Convoys could have no effect on U-boat minelaying operations and therefore could not be a general panacea. Rather, the evidence seems to show that there would have been a degree of material benefit by forcing the Flanders U-boats back to Germany, because increased radio use would have filled in a dangerous intelligence black hole. As shown by the cases of *UB72* and *UC65*, a better intelligence picture of the U-boats at sea gathered by radio intelligence could create a viable means of fighting back. It is though, only the present author's theory that Jellicoe and his planners tacitly recognized this benefit when pushing for a land campaign to re-take the Flanders harbours.

It is, of course, a moot point to debate what might have happened if the Flanders flotilla had been driven out of its bases, or whether the cost to the British army would have made it worthwhile. However, it should be pointed out that the equally unsuccessful Zeebrugge Raid of April 1918 sought to achieve what Passchendaele could not. Clearly the Flanders flotilla was regarded as major threat, and one that remained viable into the late summer of 1918. Controlled sailings and the belated completion of the Dover minefield could only partly ameliorate its destructive effects: greater radio intelligence offered the potential to do much more.

Further archival research might be able to make a formal connection between the Flanders campaign planning and the Flanders flotilla's radio silence. However, such was the secrecy at the Admiralty at the time, this might prove a fruitless search. Nevertheless, the decision of the Flanders flotilla's commander, Korvettenkapitän Karl Bartenbach, to institute radio silence seems to have been one of the most unintentionally significant of the First World War. In strategic terms, the Flanders flotilla drew in vastly disproportionate resources dedicated to its eradication.

37 Ibid.

38 Ibid., 440

39 Spindler, *Der Handelskrieg mit U-Booten*, vol. 4, 194.

Table 3 Ships sunk by the High Seas Fleet and Flanders flotilla U-boats by all causes 1916–18 as compiled by the official German historian, Admiral Spindler

	1916		1917*		1918	
	HSF	Flanders	HSF	Flanders	HSF	Flanders
January		16	89	82	51	47
February		28	127	114	53	33
March	21	40	154	179	53	57
April	37	26	227	114	42	39
May	17	9	129	142	62	23
June	3	14	144	96	34	31
July	52	7	137	74	33	39
August	26	22	92	63	41	28
September	43	83	54	84	40	21
October	67	66	64	58	26	9
November	32	101	40	54		
December	52	100	61	59		
Total	350	512	1,229	1037	435	327

* *Spindler did not produce monthly totals of ships sunk for 1917. The author is grateful to Michael Lowrey for deriving the figures from Spindler's original data.*

Conclusion

The creation over 17 years of fieldwork of a detailed archaeological record of U-boat wrecks produced a spatial means by which it could be compared to the 1919 appreciation of U-boats sunk. When tested against the actual U-boat wrecks, it was found to be only 48 per cent correct for the English Channel. It will be interesting to see how, when the archaeological record of lost U-boats in the broader northern theatre has been completed, the overall accuracy rate may change. The secretive practices of the Flanders flotilla in the English Channel probably contributed a stronger negative bias in this region.

Comparing the 1919 and 2018 lists has exposed some of the errors made in 1919 to greater scrutiny. It is now clear that wishful thinking and a desire to demonstrate success created a number of very unreliable U-boat loss assessments, which have now become baked into the 'standard sources' and repeated unquestioningly in many secondary works. This was not, however, the case in the Second World War where all assessments in the English Channel were made in observance of the rules.

In both World Wars, the importance of radio intelligence in establishing the disposition of U-boats at sea was a crucial component in beating them. Of note is the fact that in 1945 the U-boats operated in the English Channel employed radio silence. The accuracy of the 1946 list fell to just 36 per cent during that time using the same methodology outlined in this article.⁴⁰

The recognition of the true danger posed by the Flanders flotilla's institution of radio silence has been slow to emerge. This article has attempted to demonstrate its true significance. An article covering Second World War U-boat losses in the same geographic area using the same methodologies is being prepared for later publication.

⁴⁰ McCartney, *The Maritime Archaeology of a Modern Conflict*, 289–9.2.

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