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Declassified: US nuclear weapons at sea during the Cold War

Robert S. Norris and Hans M. Kristensen

ABSTRACT
Newly declassified documents from the US Defense Department show how many nuclear weapons the United States deployed at sea between 1953 and 1991. The documents, which give totals for the Atlantic Ocean, Pacific Ocean, and Mediterranean Sea, show that the number of US nuclear weapons afloat peaked in 1975 at 6,191 warheads, at the time nearly 23 percent of the US nuclear weapons stockpile. From 1974 to 1991, US fleets at sea routinely carried more than 5,000 nuclear weapons in total, or approximately 20 percent of the entire nuclear weapons stockpile. In 1991, US President George H. W. Bush decided to off-load all nonstrategic nuclear weapons from the fleet, a task completed in 1992. The number of US nuclear weapons currently at sea remains an official secret, but the authors have estimated the number of deployed warheads on ballistic missiles to create an extended timeline through 2015.

KEYWORDS
Defense; missiles; nuclear weapons; SLBM; SSBN; US Navy

In February 2015, the US Defense Department declassified numbers on how many nuclear weapons the United States deployed at sea between 1953 and 1991 (US Defense Department 2015). The declassification shows the total number of nuclear weapons that were on board a variety of naval vessels – including aircraft carriers, cruisers, destroyers, frigates, attack submarines, and ballistic missile submarines – at the end of each fiscal year in the Atlantic and Pacific oceans and the Mediterranean Sea (see Table 1).

We last wrote about US nuclear weapons afloat during that period in a 1999 Nuclear Notebook column (Norris, Arkin, and Burr, 1999). It used information from an important Pentagon study released under the Freedom of Information Act. However, our estimates made at the time from sanitized graphs were approximate. With this new declassification, we now have hard numbers.

The declassification shows that the number of US nuclear weapons at sea peaked in 1975 at 6,191 warheads, at the time nearly 23 percent of the US nuclear weapons stockpile. The number afloat stayed about the same for the subsequent decade and a half, even as the total size of the nuclear arsenal shrank, until US President George H. W. Bush decided in September 1991 to off-load all nonstrategic nuclear weapons from the fleet. From 1974 to 1991, US fleets at sea routinely carried more than 5,000 nuclear weapons in total, or approximately 20 percent of the entire nuclear weapons stockpile.

The off-loading of nonstrategic weapons was completed in the summer of 1992, and since then, the only US nuclear weapons deployed at sea have been strategic warheads on ballistic missile submarines. The declassified afloat numbers do not include weapons after 1991, so the number of US nuclear weapons currently at sea remains an official secret. But we have estimated the number of deployed warheads on ballistic missiles to create an extended timeline through 2015 (see Figure 1).

The timeline shows that while the total number of warheads at sea declined rapidly in 1991 with the off-loading of all nonstrategic weapons, it increased again between 1993 and 1999 as more Ohio-class ballistic missile submarines were deployed. The all-time high for share of the US nuclear stockpile afloat occurred in 2000 at nearly 33 percent. Today, roughly 22 percent of the stockpile is afloat.

The declassification of these numbers helps illustrate the extent to which US nuclear planning during the Cold War was focused on deterring a Soviet attack on NATO and North America. In the Atlantic Ocean, the peak year for number of US nuclear weapons afloat was 1975, with more than 4,500 nuclear weapons on board naval vessels. Most US ballistic missile submarines at the time operated in the Atlantic, and their missiles started carrying significantly more warheads in the early 1970s with the deployment of multiple independently targetable reentry vehicles.

Deployment peaked later in the Pacific, in 1987, with 2,085 nuclear weapons then stationed there. The increase was primarily due to the introduction of the Trident missile submarines in the Pacific Fleet beginning in 1982.

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Table 1. United States nuclear weapons afloat 1953–1991.

Year	Atlantic	Pacific	Mediterranean	Total
1953				0
1954				91
1955				129
1956				292
1957				521
1958				757
1959				1124
1960				1516
1961	854	550	267	1671
1962	745	811	269	1825
1963	999	703	280	1982
1964	1384	1035	292	2711
1965	1544	1571	619	3734
1966	1650	1792	453	3895
1967	1930	1420	404	3754
1968	1956	1709	425	4090
1969	1858	1426	400	3684
1970	2012	1403	411	3826
1971	2065	1381	552	3998
1972	2500	1758	596	4854
1973	3387	1129	427	4943
1974	4165	1292	403	5860
1975	4507	1244	440	6191
1976	4506	1089	433	6028
1977	4185	1318	400	5903
1978	4177	1191	402	5770
1979	4039	1170	342	5551
1980	3961	968	278	5207
1981	3588	811	390	4789
1982	4038	881	528	5447
1983	3823	1043	242	5108
1984	3950	1213	376	5539
1985	3773	1481	190	5444
1986	3291	1853	349	5493
1987	3398	2085	0	5483
1988	3573	1949	0	5522
1989	3419	1949	0	5368
1990	3827	1889	0	5716
1991	3048	1661	0	4709

Source: US Defense Department (2015) Nuclear Weapons Afloat End of Fiscal Years 1953–1991. Available at http://open. defense.gov/Portals/23/Documents/frddwg/weapons_afloat_unclass.pdf.

Mediterranean deployments

The number of US nuclear weapons afloat in the Mediterranean Sea was always much lower than in the Atlantic and Pacific oceans, and peaked early at close to 600 weapons in the early 1970s.

But the declassification shows, interestingly, that the level abruptly dropped to zero in 1987 and stayed there. This suggests that all nonstrategic nuclear weapons were off-loaded early from United States Sixth Fleet ships and submarines in 1986 and 1987. Why this happened is unclear.

The declassified numbers represent a snapshot; they only count weapons afloat on one particular day of each year (September 30). So although the Mediterranean numbers show no nuclear weapons after 1986, they do not include warheads on board vessels that entered the Mediterranean Sea from the Atlantic at any time during the rest of the year. During the late 1980s and early 1990s, US aircraft carriers carrying about 100 nuclear bombs each continued to deploy into the Mediterranean Sea during their cruises, as did nuclear-armed cruisers, destroyers, frigates, and submarines. This nuclear presence continued until mid-1992, when the last nonstrategic naval nuclear weapons were off-loaded from the fleet.

US ballistic missile submarines also operated in the Mediterranean Sea from the early 1960s to the late 1970s from Naval Station Rota in southern Spain. Longer-range Trident submarine-launched ballistic missiles (SLBMs) removed the need to conduct continuous deterrent patrols in the Mediterranean Sea. Even so, US ballistic

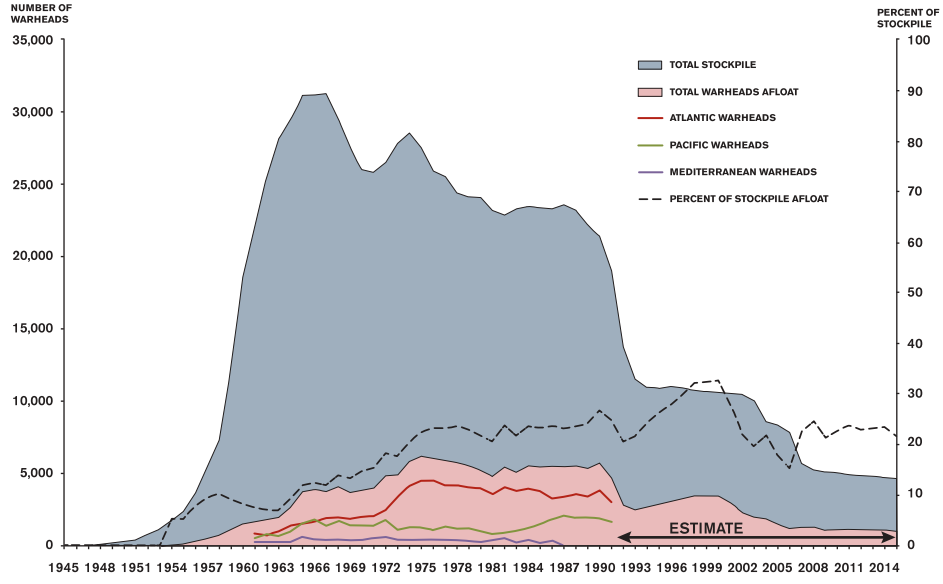

Figure 1. US nuclear warheads afloat, 1945–2015.

Notes: The graph shows warhead numbers at the end of each fiscal year (June 30 prior to 1976 and September 30 since then). It is not clear if the declassified afloat numbers include warheads that were deployed in other seas, such as the Indian Ocean or the Arctic Ocean. Source: US Defense Department; US State Department; authors' estimates.

Table 2. United States naval nuclear weapons 1953–1991.

Weapon type	Yield (kt)	Platform	Time period
B5 bomb	6–120	Aircraft carriers	1952–1963
Mk 5 SSM warhead	10–45	Submarines (SSG, SSGN), aircraft carriers, cruisers	1959–1964
Mk 6 bomb	8–160	Aircraft carriers	1951–1961
B7 bomb	8–61	Aircraft carriers	1952–1957
B7 depth bomb (Mk 90 Betty)	8–61	Aircraft carriers, shore bases	1955–1963
B8 bomb	20–30	Aircraft carriers	1951–1957
B11 bomb	10–20	Aircraft carriers	1956–1960
B12 bomb	12–14	Aircraft carriers	1954–1958
B15 bomb	3400	Aircraft carriers	1955–1965
Mk 23 projectile	15–20	Battleships	1956–1962
B27 bomb	2000	Aircraft carriers	1958–1969
W27 SSM warhead	2000	Submarines (SSG, SSGN), aircraft carriers, cruisers	1957–1965
B28 bomb	70–1450	Aircraft carriers, shore bases	1958–1991
W30 SAM warhead	5	Cruisers	1959–1979
W34 depth bomb (Mk 101 Lulu, Mk 105 Hotpoint)	10–15	Aircraft carriers, shore bases	1958–1971
W34 torpedo (Mk 45 ASTOR)	10–15	Submarines (SS, SSN)	1960–1977
B39 bomb	3800	Aircraft carriers	1957–1966
B43 bomb	70–1000	Aircraft carriers	1961–1991
W44 depth bomb (ASROC)	5	Cruisers, destroyers, frigates	1961–1989
W45 SAM (Terrier)	0.5–15	Cruisers, destroyers	1962–1987
Mk 47 SLBM warhead	600–1200	Submarines (SSBN)	1960–1974
W55 depth bomb (SUBROC)	1–5	Submarines	1965–1988
B57 bomb/depth bomb	5–20	Aircraft carriers, shore bases	1963–1992
W58 SLBM warhead	200	Submarines (SSBN)	1964–1981
B61 bomb	10–300	Aircraft carriers	1968–1994*
W68 SLBM warhead	40–50	Submarines (SSBN)	1970–1991
W76 SLBM warhead	100	Submarines (SSBN)	1979-
W80-0 SLCM warhead (Tomahawk)	5–150	Submarines (SSN), battleships, cruisers, destroyers	1982–2011
W88 SLBM warhead	455	Submarines (SSBN)	1990-

* The B61 bomb is still in service with the US Air Force but all aircraft carriers have been denuclearized.

Source: Polmar N and Norris RS (2009). The U.S. Nuclear Arsenal: A History of Weapons and Delivery Systems Since 1945. Annapolis, Maryland: Naval Institute Press.

ASROC: anti-submarine rocket SAM: surface-to-air missile.

kt: kiloton.

SLBM: submarine-launched ballistic missile SLCM: sea-launched cruise missile.

SS: diesel-electric attack submarine.

SSBN: nuclear-powered ballistic missile submarine SSG: guided-missile submarine.

SSGN: nuclear-powered guided-missile submarine SSM: surface-to-surface missile.

SSN: nuclear-powered attack submarine SUBROC: submarine rocket.

missile submarines continued to conduct occasional visits to Mediterranean ports with nuclear weapons on board. One such visit, by the *Louisiana* (SSBN-743) to Souda Bay on Crete, took place from December 12 to 16, 1999. The ship's Command History states that the port visit occurred during the "Alert Strategic Deterrent Patrol in support of national tasking" that included a "Mediterranean Sea Patrol" (US Navy 2001).

A myriad of weapons and platforms

The declassified afloat numbers do not show how many types of weapons were deployed on how many vessels, but we do know that the types of naval nuclear weapons were many. From the 1940s to the early 1990s, deployed aircraft carriers each carried approximately 100 nuclear bombs for delivery by 22 versions of 12 different nuclear-capable aircraft types (US Navy 1993). The bombs included those intended for land attack with fighter jets, as well as anti-submarine depth bombs intended for use by helicopters and planes to protect the aircraft carrier and accompanying ships from Soviet attack submarines or surface vessels.

Other nuclear weapons deployed at sea included surface-to-air missiles, anti-submarine rockets, land-attack cruise missiles, torpedoes, and of course reentry vehicles on top of hundreds of ballistic missiles in the hulls of dozens of strategic submarines (see Table 2).

In addition to the weapons afloat listed in the new Defense Department declassification, the US Navy had other nuclear weapons deployed in various places on land, including in Canada, Cuba (Guantanamo Bay), Italy, Morocco, Puerto Rico, and the United Kingdom on the Atlantic side, and, on the Pacific side, in Guam, Midway, Okinawa (until 1972), and the Philippines. In the Mediterranean, the US Navy had nuclear weapons deployed in Spain and Italy.

The newly declassified numbers add important information to a growing pool of nuclear weapons data released by the US government (US Defense Department 2010; US State Department 2015). Making such information available increases nuclear transparency and improves the public's ability to debate and understand the history and status of nuclear policy. We urge other nuclear weapon states to follow the US example and release information about their arsenals and operations during the Cold War.

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