



Research Guide To Submarine Arctic Operations

*A list of materials available at the
Submarine Force Library & Archives*

Featuring images & documents from the archival collection

Submarine Arctic Operations

A list of Materials Available at the Submarine Force Library & Archives

Introduction:

This guide provides a listing of research material available at the Submarine Force Library and Archives on the topic of Submarine Arctic Operations. The collection includes both published and unpublished sources. The items listed in this guide may be viewed, by appointment at the museum library. Inter-library loan is not available. Library hours are; Monday, Wednesday, Thursday, and Friday 9:00 – 11:30 and 1:00 – 3:45. Currently, the library is unable to provide photocopy or photographic duplication services. Although a few courtesy copies can be provided, researchers should come prepared to take notes. Researchers are permitted to use their own cameras to take photographs of images in the collection. For further information, or to schedule a visit, please call the Archivist at (860) 694-3558 x 12, or visit our web site at: www.ussnautilus.org

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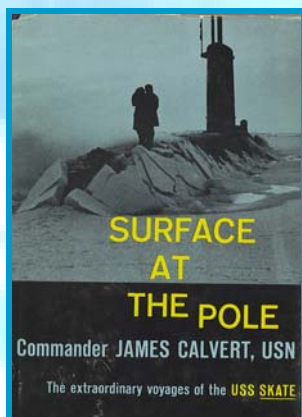
Chronology

- XII U.S. Submarine Arctic Operations – Historical Timeline

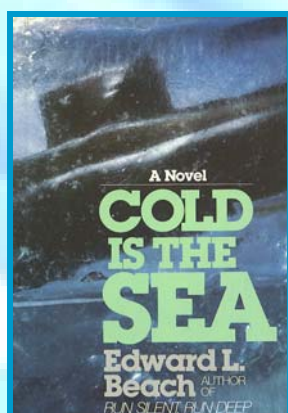


USS HAMPTON (SSN 767) – ICEX '04

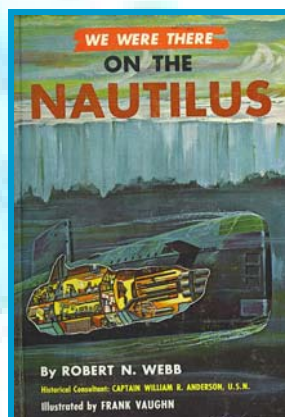
Books



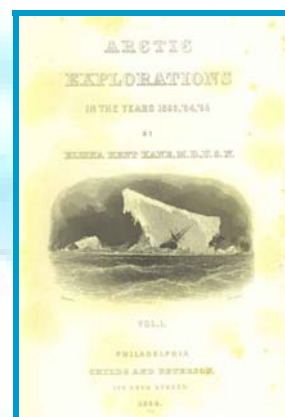
Non-Fiction



Fiction



Children's



Rare Books

Non-Fiction

- J9.80
A467 Althoff, William F. Arctic Mission: By Airship & Submarine to the Far North. Auckland, New Zealand: Lighter-Than-Air Institute, 1999. 291 p., illus. ISBN: 0-9583693-3-X
- E8.0
A552 Anderson, William R. Nautilus 90-North. By Commander William R. Anderson with Clay Blair, Jr. New York: World, 1959. 251 p., illus. LC 59-6656
- E8.0
A552 Anderson, William R. with Don Keith. The Ice Diaries: The Untold Story of the Cold War's Most Daring Mission. Nashville: Thomas Nelson, 2008. 360 p.: illus. ISBN 978-0-7852-2759-5
- E8.0
C167 Calvert, James. Surface at the Pole: The Extraordinary voyages of the USS Skate. New York: McGraw, 1960. 220 p., illus.
- E8.0
L438 Leary, William M. Under Ice: Waldo Lyon and the Development of the Arctic Submarine. College Station : Texas A&M University Press, 1999. 303 p. : illus., maps
- E8.0
M161 McLaren, Alfred S. Unknown Waters: A First-Hand Account of the Historic Under-ice Survey of the Siberian Continental Shelf by USS Queenfish (SSN-651). University of Alabama Press, 2008. 242 p.: illus. ISBN 978-0817316020
- E8.0
M169 McNally, William. Nautilus (SSN 571). The McNally Institute, 2001. 204 p., illus. ISBN 0-9670068-2-1
- A2.70
N327 Naval Arctic Operations Handbook: Part I General Information. Washington, DC: Office of the Chief of Naval Operations, 1949. illus.
- A2.70
N327 Naval Arctic Operations Handbook: Part II Operational Notes. Washington, DC: Office of the Chief of Naval Operations, 1949. illus.
- E8.0
S814 Steele, George P. Seadragon: Northwest Under the Ice. New York: E.P. Dutton, 1962. 255 p., illus. LC 62-7802

- A2.80
N327 Toward the Poles (A Brief Account of Polar Exploration). Washington, DC: Department of the Navy, 1950. 230 p.; maps.
- J9.60
W685 Wilkins, George Hubert, Sir. Under the North Pole: The Wilkins-Ellsworth Submarine Expedition. New York: Brewer, Warren & Putnam, 1931. 347 p., illus.
- E8.0
W725 Williams, Marion D. Submarines Under Ice: The U.S. Navy's Polar Operations. Annapolis: Naval Institute Press, 1998. 223 p., illus.

Fiction:

- FICT
BEA Beach, Edward Latimer. Cold is the Sea. New York : Holt, Rinehart and Winston, 1978. 348 p
- FICT
GAL Gallery, Dan. The Brink. New York: Doubleday, 1968. 317 p. LC 68-24835
- FICT
HEN Henrick, Richard P. Ice Wolf. New York: Harper Collins, 1994. 337 p. ISBN 0-06-100648-3
- FICT
HEN Henrick, Richard P. Under the Ice. New York: Kensington, 1989. 383 p. ISBN 0-8217-2808-3
- FICT
MCL MacLean, Alistair. Ice Station Zebra. New York: Doubleday, 1963. 218 p.
- FICT
ROB Robinson, Patrick. Kilo Class. New York: Harper Collins, 1998. 442 p. LC 97-51172. ISBN 0-06-019129-5

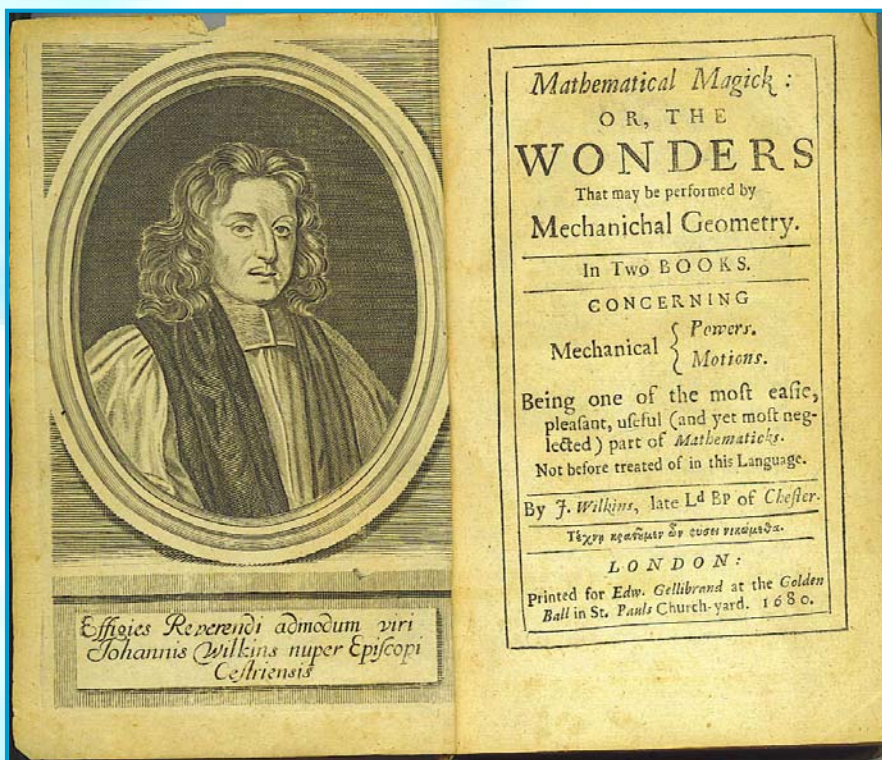
Children's Books:

- E8.0
A552
J Anderson, William R. First Under the North Pole. The Voyage of the NAUTILUS. New York: World, 1959. 62 p., illus. LC 59-7745
- FICT
ROC
J Rockwood, Roy. Under the Ocean to the South Pole. Or The Strange Cruise of the Submarine Wonder. New York: Cupples & Leon, 1907.
- FICT
WEB
J Webb, Robert N. We Were There on the Nautilus. New York: Grosset & Dunlap, 1961. 178 p.

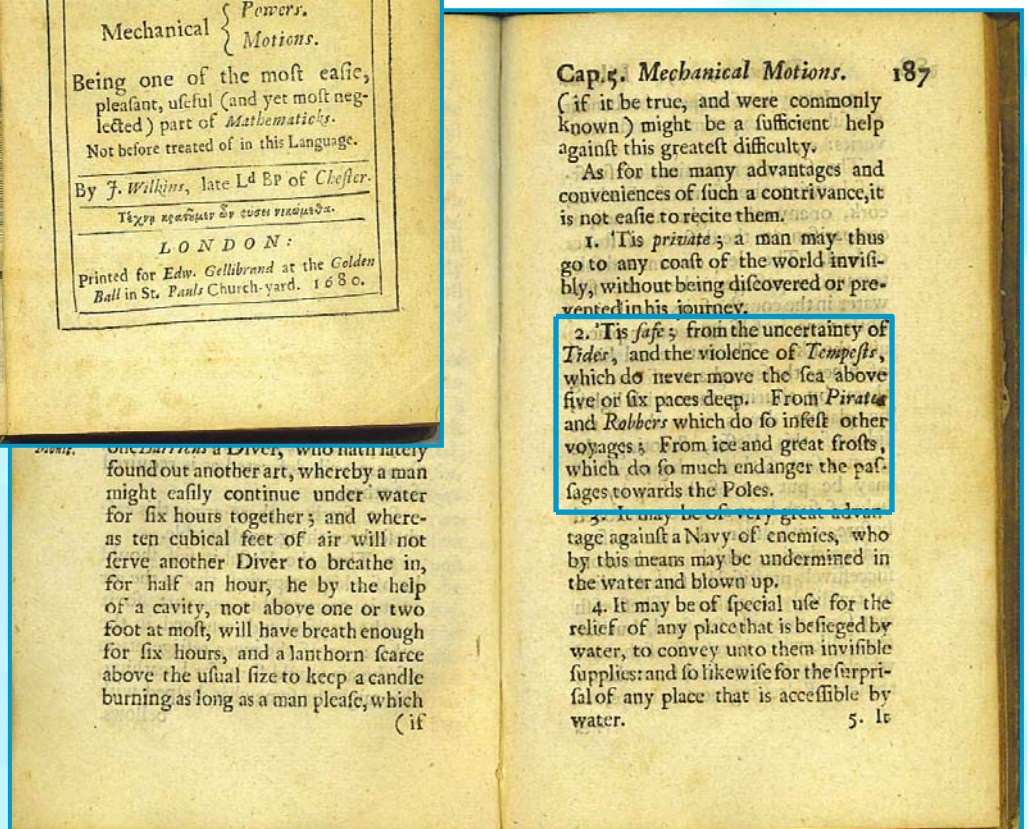
Rare Books:

The story of polar exploration and discovery is largely a naval and maritime one, and these following rare books tell some of the early attempts to reach the North Pole by ship.

- J9.40 Greely, Adolphus W. Three years of Arctic Service: an account of the Lady Franklin
G794 Bay Expedition of 1881-84 and the attainment of the farthest North. New
RB York: C. Scribner's Sons, 1886. illus. Maps
- J9.40 Kane, Elisha Kent Arctic Explorations: the Second Grinnell Expedition in search of Sir
K16 John Franklin, 1853, '54, '55. Philadelphia: Childs & Peterson, 1956 illus.,
RB maps.
- J9.60 Wilkins, George Hubert, Sir Under the North Pole: The Wilkins-Ellsworth Submarine
W685 Expedition. New York: Brewer, Warren & Putnam, 1931. 347 p.; illus., map
RB
- F0.21 Wilkins, John Mathematical Magick, or, The Wonders that may be performed by
W684 Mechanical [sic] Geometry... London: Printed for Edw. Gellibrand, 1680.
RB woodcuts & engravings



Portion of text from Chapter 5:
“Concerning the possibility of framing an Ark for Submarine Navigations. The difficulties and conveniences of such a contrivance.”



Periodical Articles

Naval Journals & Magazines

All Hands

- July 1959 "Skating under the Ice," H. George Baker, p. 2 (4 p)
May 1960 "Touring the North by Submarine," H. George Baker, p. 6 (2 p)
Jan 1963 "See You at the North Pole," p. 10 (2 p)
Sept 1963 "Navy's Role from Pole to Pole," Robert Neil, p.6 (6 p)
Apr 1999 "Ice Breaker," Darrell D. Ames, p.36 (2 p)
Aug 1999 "The Iceman Cometh," Rodney J. Furry, p.14 (4 p)

U.S. Naval Institute Proceedings:

- Sept 1952 "The Arctic Submarine," LCDR R.D. McWethy, p. 955 (4 p)
Feb 1958 "Under the Polar Cap: A Voyage that Must be Made," G.W. Kittredge, p. 61 (5 p)
May 1958 "Significance of the Nautilus Polar Cruise," Robert D. McWethy, p. 32 (4 p)
Dec 1958 "Navigating Under the North Pole Ice Cap," Shepherd M. Jenks, p. 62 (6 p)
Sept 1959 "Skate Breakthrough at the North Pole," William H. Layman, p. 32 (6 p)
"Arctic Submarine Material," Carvel Hall Blair, P. 39 (7)
Sept 1960 "Arctic Oceanography by Submarines," E.C. Laford, p. 90 (7 p)
Oct 1961 "The Opening of the Arctic Ocean," James T. Strong, p. 58 (8 p)
Mar 1962 "Arctic ASW," Gordon V. Braun, p.53 (5 p)
Feb 1965 "Submarines in the Ice," Peter Cobb, p. 148 (3 p)
July 1981 "Under the Ice in Submarines," Alfred S. McLaren, p. 105 (5 p)
June 1984 "Sailing Under the Ice," Norman Polmar, p. 121 (3 p)
June 1986 "Tracking Soviet Submarines Under the Arctic Ice Pack," Scott Lowery, p. 105 (2 p)
Sept 1987 "To the North Pole," Dean C. Allard, p. 56 (10 p)
"ComNavFor Arctic," Leonard A. LeSchack, p 74 (7 p)
"Fighting Subs Under the Ice," Edward B. Atkeson, p. 81 (7 p)
Aug 1991 "Submarines in the Ice," Norman Polmar, p. 105 (2)
Feb 1992 "Submarine Combat in the Ice," Waldo K. Lyon, p. 33 (8 p)
Apr 2000 "Breaking the Ice," Robert H. Perry, p.34 (5)

Submarine Journals & Magazines

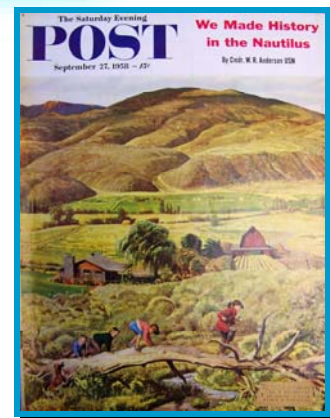
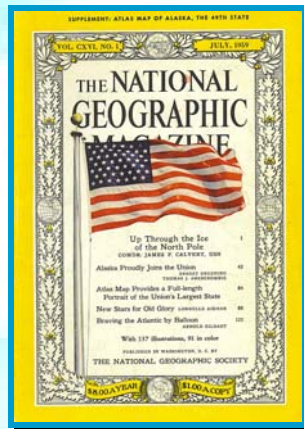
The Submarine Review

- July 1983 "Arctic Submarine Warfare," Hamlin Caldwell, p. 4 (10 p)
Jan 1984 "Arctic Submarine Beginnings," Alfred S. McLaren, p. 45 (7 p)
Oct 1985 "Under Ice Operations," T.M. LeMarchand, p. 7 (13 p)
July 1986 "The Marginal Ice Zone," p. 59 (8 p)
July 1987 "Factors in Arctic Submarine OPS," George Newton, p. 22 (10 p)
Oct 1989 "Arctic Submarine Warfare," George Newton, p. 14 (7)
Oct 1991 "Submarine Arctic Operations-Requirements, Challenges, Progress," George Newton, p. 99 (7 p)
Apr 1993 "Conversion of a Russian DELTA III Submarine for Arctic Research," George Newton, p. 76 (6 p)
Jan 1994 "Arctic Addendum to Submarine Roles in the 1990's and Beyond," Waldo Lyon, p.45 (3 p)
Apr 2001 "Don't Forget the Arctic," George B. Newton, p.91 (10)

Undersea Warfare

- Winter 1998/9 “USS HAWKBILL (SSN 666) Completes SCICEX ’98,” COMSUBPAC, p.26 (2)
Summer 1999 “SCICEX-99: Undersea Science at the Top of the World,” CAPT Gordon, I. Peterson & LCDR Dave Werner, p.6 (4).
Summer 2000 “National Ice Center/Naval Ice Center Support to Submarine Operations,” CDR Zdenka Willis, et al, p 18 (4)
Winter 2001 “Arctic Challenge: Under the Polar Ice Cap,” ETC (SS) Paul Beach, p. (3)
Summer 2001 “A New Era in the Arctic,” p. 25 (2)
Fall 2003 “On Top of the World,” CDR Bob Clark, p. 2 (6)
Summer 2004 “Heading North! Honolulu Deployment Marks First 1st-Flight 688 Surface at the North Pole,” CDR Chuck Harris p. 16 (5)
“Heading North! Hampton Crew tours the North Pole with HMS Tireless in Joint Arctic Exercise,” JOC Kevin Elliot p. 17 (1)
Spring 2007 “ICEX 2007: Postcards from the Top,” Jeff Gossett, p. 4 (4)

General interest periodicals – Historic Issues



Life

- September 1, 1958 “Epic Voyage of ‘Nautilus’: The Crew’s Own Story,” plus 12 color pages on Awesome look of Undersea Warfare.

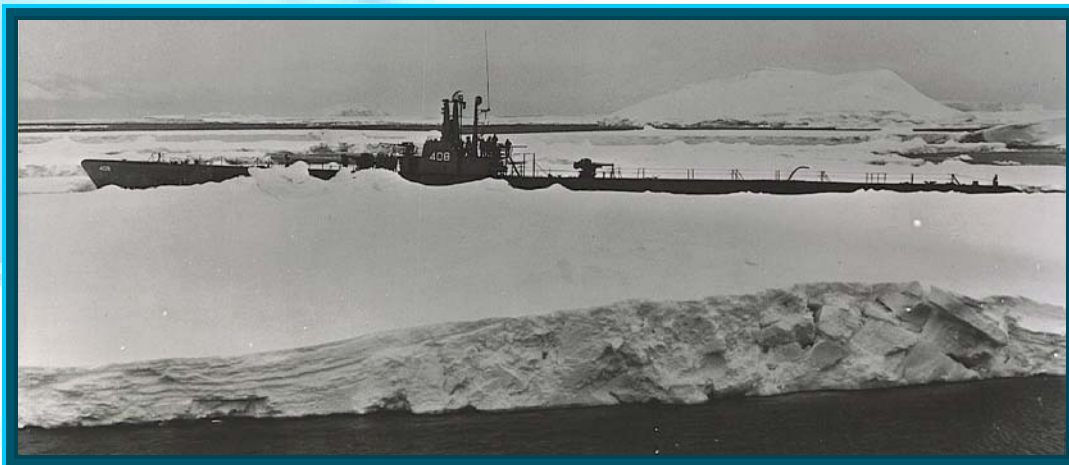
National Geographic Magazine

- January, 1959 “First Crossing of the Ends of the Earth: ‘Submarine Through the North Pole,’ LT William G. Lator, Jr. & ‘The Crossing of the Antarctic,’ Sir Vivian Fuchs
“The Arctic as a Sea route of the Future,” CDR William R. Anderson
July 1959 “Up Through the Ice of the North Pole,” CDR James F. Calvert

The Saturday Evening Post

- September 27, 1958 “We Made History in the Nautilus, Part I” CDR William R. Anderson
October 4, 1958 “We Made History in the Nautilus, Part II” CDR William R. Anderson
October 11, 1958 “We Made History in the Nautilus, Part III” CDR William R. Anderson

Vertical Files



USS SENNET (SS 408) – Operation Highjump

Arctic/Antarctic Operations

General

Arctic Submarine Lab

“Polar Times” (American Polar Society Journal) –

December, 1968, December 1969, December 1970, June 1971

Antarctic

Clippings

Operation Deep Freeze Expedition (1964-1965)

Operation Highjump (1947)

Photographs

Arctic

Clippings

ICEX (1-93), (3-00), (1-01), (2007)

Monographs

Photographs

SCICEX (93), (95), (96), (98), (99)

Technology

Voyages, lists of

Navigation

Inertial Navigation

Submarine Lore & Trivia

Firsts

*Clipping, New London Day – May 3, 1947
showing early Navy interest in the “Polar Concept”*

Navy Plans New Test in Sub Warfare

WASHINGTON (AP) — The navy plans a \$55,580,000 experiment in new phases of undersea warfare, including the use of submarines to detect airplanes over the Arctic ocean.

The department asked congress last night for authority to convert nine destroyers, four submarines and two other ships for operations in the Polar regions.

Three of the submarines would be made into troop or cargo carriers and the fourth would become an Arctic “picket” or reconnaissance craft.

The destroyers would be equipped with latest anti-submarine devices, some on the secret list, presumably to cope with such fast, long-range undersea boats as the Germans put into action toward the end of World War II.

The two other ships are a speedy attack transport, to be equipped with icebreaking equipment for carrying troops and cargo in Arctic waters, and one LSD (landing ship, dock) which can be modified into a type capable of carrying heavy construction cargo through ice fields.

Emphasis on ‘Polar Concept’

Military strategists have been placing increasing emphasis on the “Polar concept” of a possible future war because the shortest way for aircraft and guided missiles to reach this country from Europe is over the North Pole.

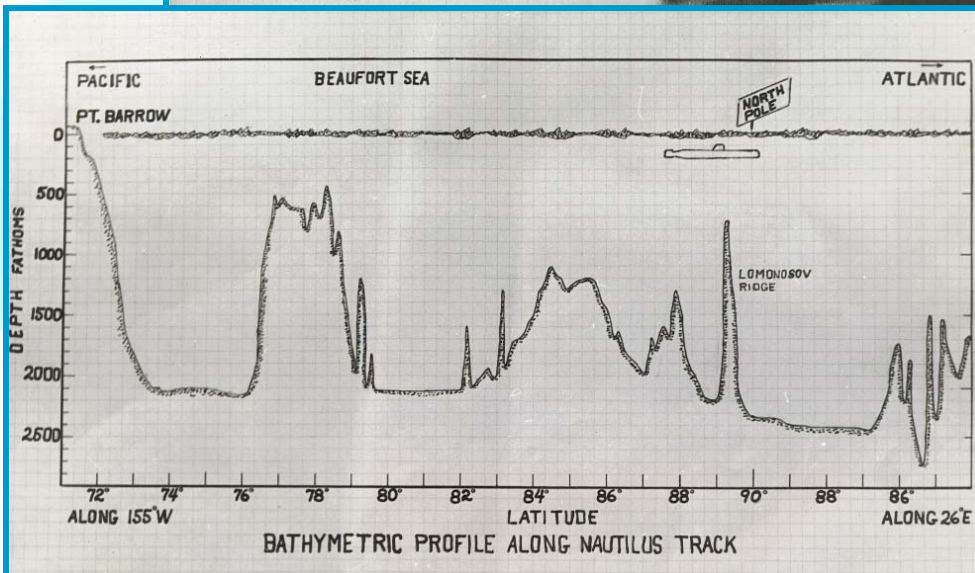
The navy's request last night...

Personal Papers Collections

PP#1
JENKS

Shepherd M. Jenks Papers
(Speeches/Photographs/Memorabilia – 1967)

The collection is comprised of correspondence, memorabilia, photographs, and speeches from the 1967 conference on U.S. Polar Exploration sponsored by the National Archives. The conference marked the formal opening of the Center for Polar Archives in the National Archives. Commander Shepherd M. Jenks, navigator on USS NAUTILUS (SSN 571) on its historic voyage under the North Pole, delivered a speech at the conference.



Jenks (standing) and NAUTILUS Commanding Officer, William Anderson review navigational charts. Photos from Jenks Personal Papers collection.

PP# 56

KRAWCZYK

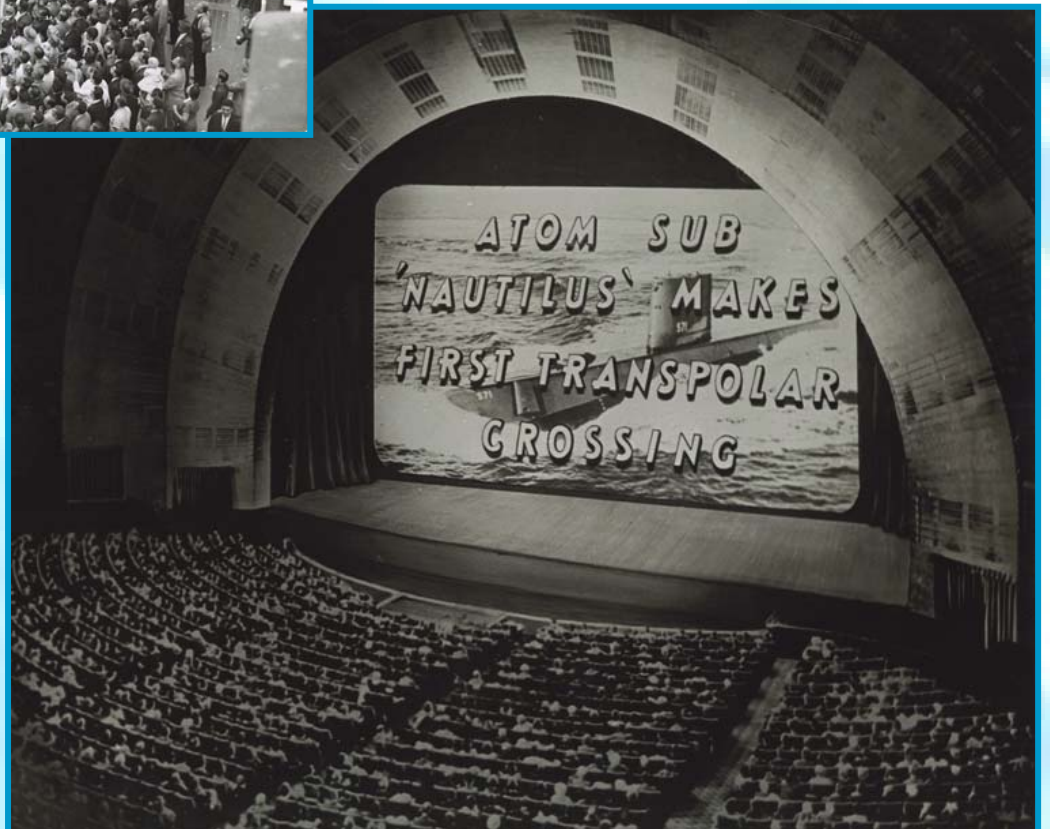
John J. Krawczyk Collection

(Photographs, newspapers, memorabilia, alumni & reunion souvenirs)

Original NAUTILUS crewmember, Chief Fire Control Technician John Krawczyk, served as the “official ship’s photographer” during his years aboard the boat. His collection consists primarily of photographs and news clippings, which provide a visual record of NAUTILUS’ early years from her keel laying through her voyage to the North Pole.



Images from the Krawczyk collection document the fascination of the American public with the story of NAUTILUS’ polar crossing and the heroic efforts of her crew.



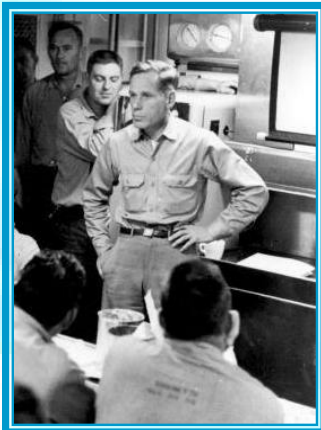
Oral Histories



Burke, Arleigh
Admiral USN, Chief of Naval Operations 1955 – 1961

Based on interviews conducted in November 1972.
249 pages of transcript plus index.

This oral history focuses primarily on Admiral Burke's relationship in a personal and in an official way with General Eisenhower, during the years of the General's Presidency. A portion of the interview includes accounts of Admiral Burke's efforts to gain presidential support for NAUTILUS' voyage to the North Pole in 1958.



Lyon, Dr. Waldo K.
Director, Arctic Submarine Laboratory

Based on three interviews from January through March 1971. 279 pages of transcript plus index.

Dr. Lyon, a 1962 presidential award winner for pioneering development that made possible submarine operations under the ice cap in the Arctic, discusses his work in that field beginning in 1941 when he first was with the Radio and Sound Laboratory. Over the years, his research has taken him afloat in many subs including SENNET in the Antarctic; NAUTILUS when she crossed under the North Pole; and SKATE and SEADRAGON during their Arctic operations. In 1951, he was instrumental in starting the Arctic Submarine Laboratory. The years of testing conventional and nuclear subs resulted in developments of special sonars, strengthened sails, and many adaptations to make submarines navigable in the Arctic waters.



Ramage, Lawson P.
Vice Admiral, USN

Transcript of twelve interviews given in 1973 and 1974. 560 pages of transcript plus index.

Admiral Ramage had a notable career in submarines. He received the 1 Medal of Honor for heroism in the Pacific War. Later he saw service in a number of capacities in Washington, DC and elsewhere. As Commander of Submarine Division 52 Ramage was involved with the first Arctic exploratory cruise in 1947. His oral history includes a description of the cruise and a discussion of some of the difficulties encountered in Arctic submarine operations.

“Boat Books”

Submarine “Boat Books:”

Unique 3-ring binders of newspaper clippings, letters and documents, general memorabilia, and photographs, known as “Boat Books,” chart the history of each U.S. submarine.

Dating from 1931, when famed Arctic explorer Sir Hubert Wilkins purchased a decommissioned US Navy submarine, USS O-12 (SS 73), and converted it for an undersea voyage to the North Pole, numerous Navy submarines have participated in Arctic operations. A boat books exists for each of the following submarines, which have conducted operations under the arctic ice or ventured to the North Pole. On the following pages, several of the more significant boat book collections are highlighted.

ALBANY (SSN 753)
ALEXANDRIA (SSN 757)
ARCHERFISH (SSN 678)
ASPRO (SSN 648)
ATULE (SS 403)
AUGUSTA (SSN 710)
BANG (SS 385)
BARBERO (SS 317)
BAYA (ESS 318)
BECUNA (SS 319)
BILLFISH (SSN 676)
BLUEFISH (SSN 675)
BOARFISH (SS 327)
BOISE (SSN 764)
CARP (SS 338)
CAVALLA (SSN 684)
CHARLOTTE (SSN 766)
CONNECTICUT (SSN 22)
DOGFISH (SS 350)
ENTEMEDOR (SS 352)
FINBACK (SSN 670)
FLYINGFISH (SSN 673)
GRAYLING (SSN 646)
GREENFISH (SS 351)
GURNARD (SSN 662)
HALFBEAK (SS 352)
HAMMERHEAD (SSN 663)
HAMPTON (SSN 767)
HARDER (SS 568)
HAWKBILL (SSN 666)
HONOLULU (SSN 718)
L. MENDEL RIVERS (SSN 686)
LAPON (SSN 661)
MEMPHIS (SSN 691)
NAUTILUS (SSN 571)

OKLAHOMA CITY (SSN 723)
PARGO (SSN 650)
PERCH (APSS 313)
PHILADELPHIA (SSN 690)
PINTADO (SSN 672)
POGY (SSN 647)
PROVIDENCE (SSN 719)
PUFFER (SSN 652)
QUEENFISH (SSN 651)
RAY (SSN 653)
REDFISH (SS 395)
SALT LAKE CITY (SSN 716)
SAN FRANCISCO (SSN 711)
SAN JUAN (SSN 751)
SAND LANCE (SSN 660)
SANTA FE (SSN 763)
SARGO (SSN 583)
SCRANTON (SSN 756)
SEA DEVIL (SSN664)
SEADragon (SSN 584)
SEAHORSE (SSN 669)
SEAWOLF (SSN 21)
SENNET (SS 408)
SILVERSIDES (SSN 679)
SKATE (SSN 578)
SPADEFISH (SSN 668)
SPRINGFIELD (SSN 761)
STURGEON (SSN 637)
TAUTOG (SSN 639)
TENCH (SS 417)
TREPANG (SSN 674)
TRIGGER (SS 564)
TROUT (SS 566)
TUSK (SS 426)
WHALE (SSN 638)

Highlighted Boat Books

The following highlighted boat books contain more numerous resources than average, or feature unique items of interest to the researcher.

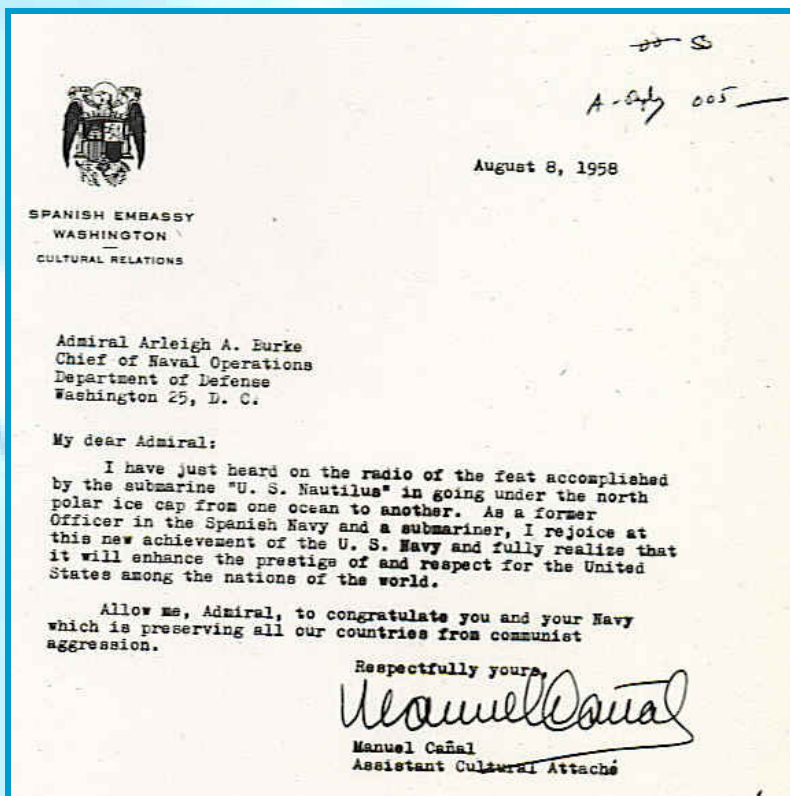
former O-12 (SS 73)

Sold by the U.S. Navy to Arctic explorer Sir Hubert Wilkins. The Wilkins' volume of the O-12 boat book consists of over 200 pages of correspondence, newspaper and magazine articles, memorabilia, and photographs of the first attempted voyage to the North Pole by submarine.



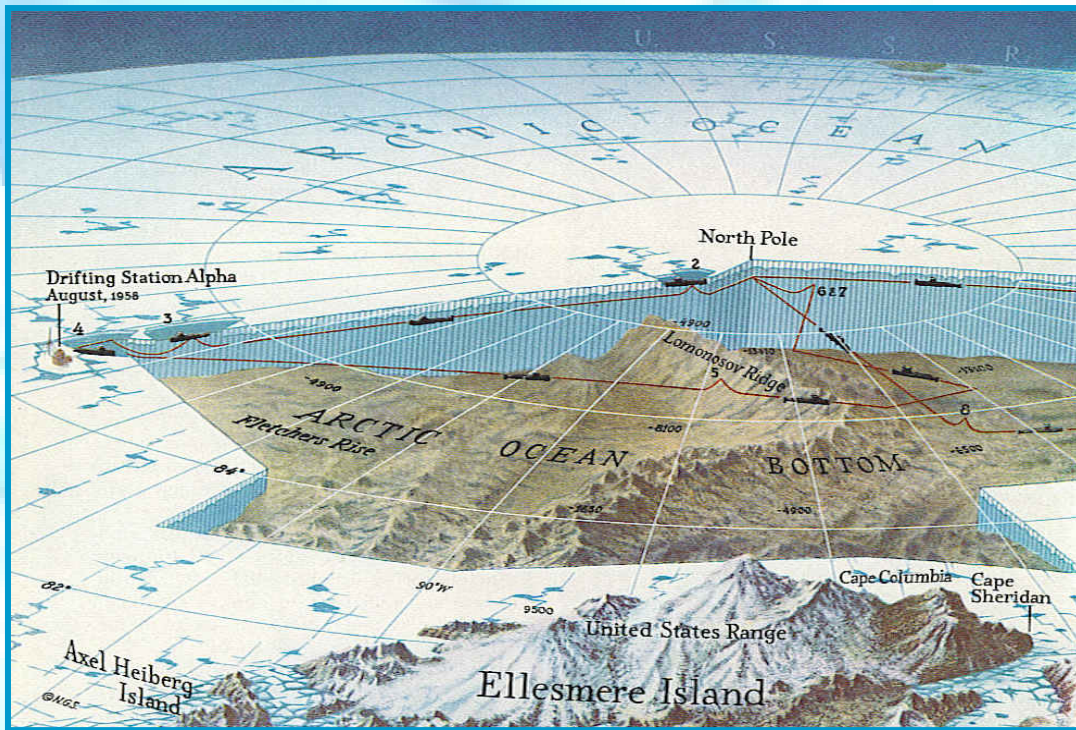
NAUTILUS (SSN 571)

Over 300 pages of clippings, photographs, and documents relating to the ship's historic crossing of the North Pole, August 3, 1958. Includes a binder donate by ADM Arleigh Burke, Chief of Naval Operations, containing copies of clippings and telegrams relating to the polar voyage, that he collected and received in the days following the announcement that NAUTILUS had reached the North Pole.



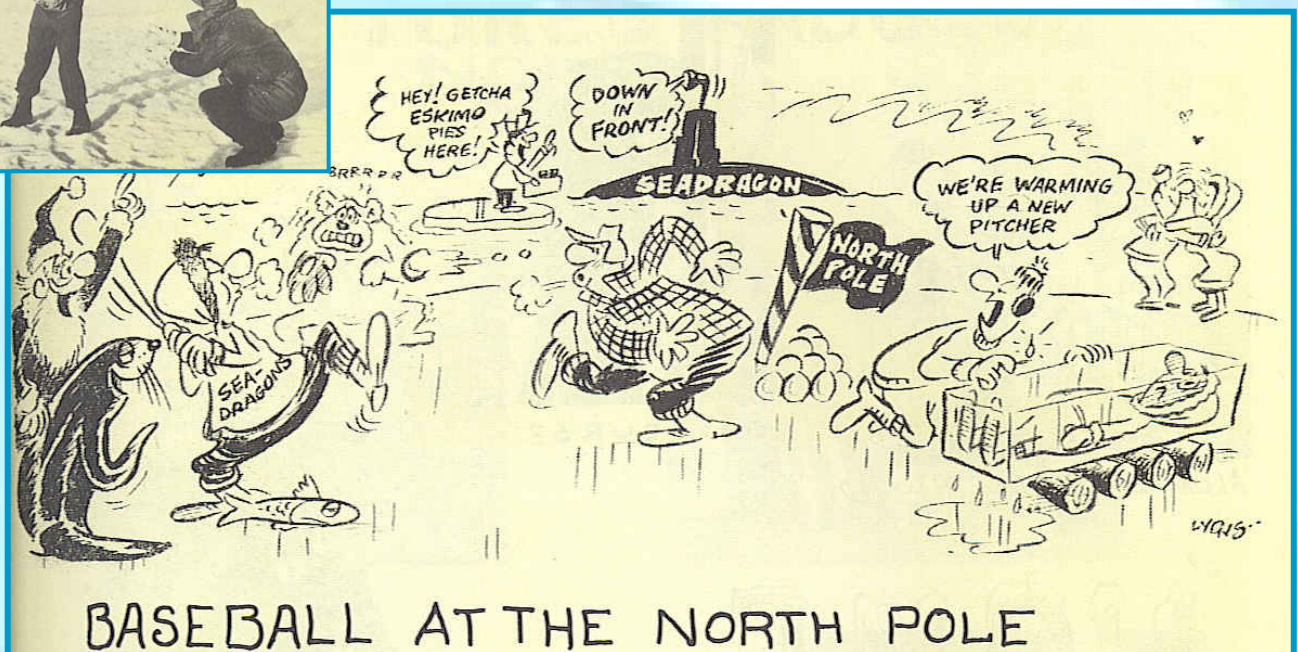
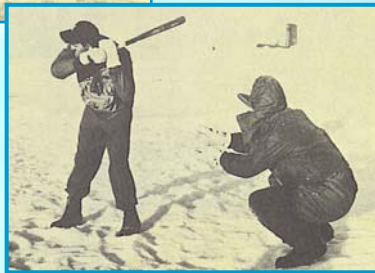
SKATE (SSN 578)

Over 200 pages of newspaper clippings, and magazine articles, as well as two dozen photographs document SKATE's numerous voyages to the Arctic, including the first submarine surfacing at the Pole.



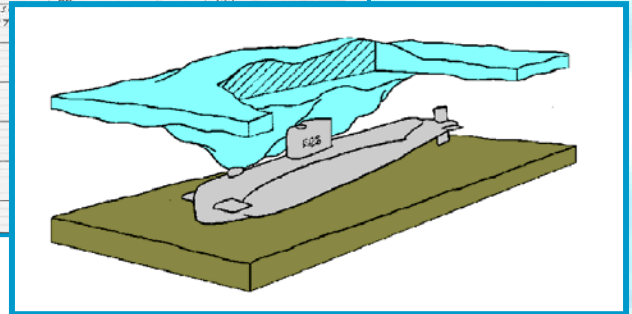
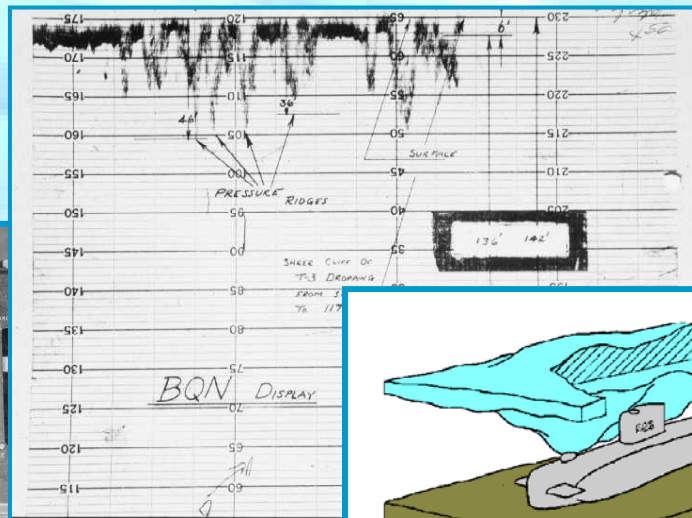
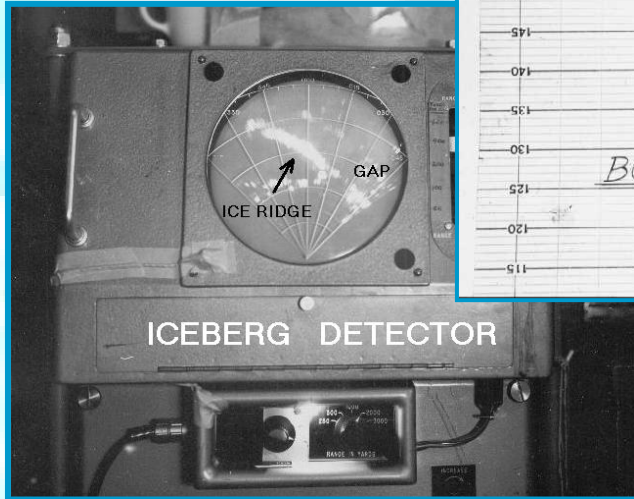
SEADRAGON (SSN 584)

Over 75 pages of articles, clippings, and documents, as well as a dozen photographs document SEADRAGON's epic first submerged transit of the Northwest Passage and surfacing at the Pole. Included in the collection is a 60 page "Cruise Book" published by the crew, which documents the historic voyage—including the first baseball game at the North Pole.



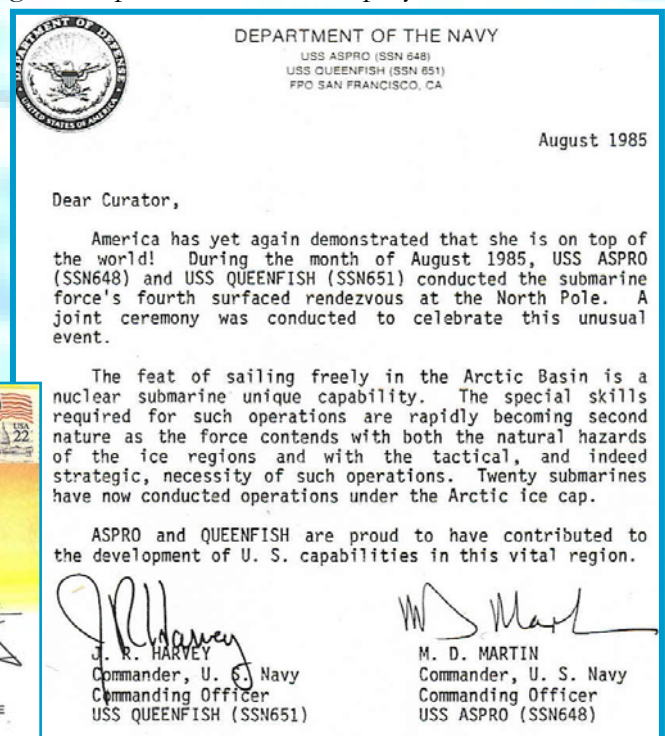
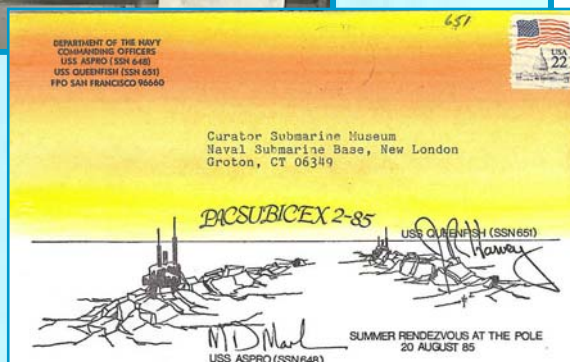
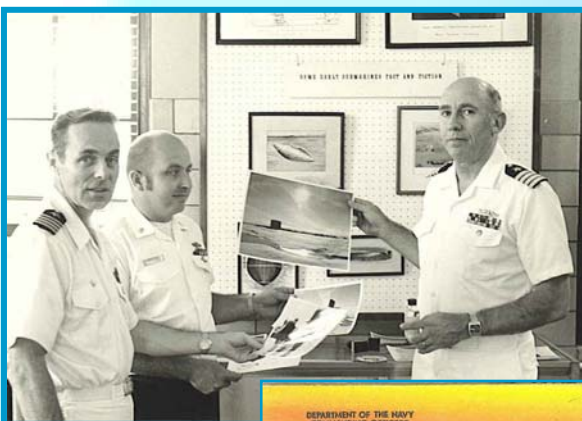
SARGO (SSN 583)

Dozens of pages of articles and photographs record SARGO's Winter Arctic Exploration in January 1960. The boat book includes a first-hand account of the voyage, in particular the difficulties encountered maneuvering around the deep underwater ice keels, written by SARGO's Captain.



QUEENFISH (SSN 651)

Cognizant of their ship's role in history, QUEENFISH's Commanding Officers have been very good at keeping the Submarine Museum informed of their history making polar voyages, and consequently the boat book contains numerous clippings, letters, memorabilia, and photographs documenting the ship's several Arctic deployments.



Audio Visual Materials

AUDIO—Record Albums

Album # 01 **Polar Cruise – USS NAUTILUS, 1958**
1 LP Album 33 1/3 - 27 minutes

“Actual Sounds & Voices recorded during the historic voyage under the North Pole.” Narrated by Herb Schriner -- Recorded from WNYC-FM New York -- 1 June 1959

AUDIO—Cassette Tapes

Audio # 01 & 18 **Polar Cruise – USS NAUTILUS, 1958**
1 Audio Cassette - 27 minutes (Copy of original album)

“Actual Sounds & Voices recorded during the historic voyage under the North Pole.” Narrated by Herb Schriner -- Recorded from WNYC-FM New York -- 1 June 1959

AUDIO—Compact Discs

Audio CD # 001 **HAMMERHEAD (SSN 663) – North Pole Surfacing**
1 Audio CD

Recording of Control Room & Sonar Room Activity during surfacing through the ice at the North Pole – LT William T. Gregory III, USN Ship's Diving Officer -- November 22, 1970

Audio CD # 003 **NAUTILUS (SSN 571) – North Pole Voyage**
1 Audio CD - 27 minutes (Copy of original album)

“Actual Sounds & Voices recorded during the historic voyage under the North Pole.” Narrated by Herb Schriner -- Recorded from WNYC-FM New York -- 1 June 1959

Audio CD #004 **SARGO (SSN 583) Surfacing at the Pole**
1 Audio CD – 10:25 minutes

Contains the Commanding Officer's (LCDR John H. Nicholson) announcement, to the crew, at 0934 on February 9, Sargo passing 350 feet beneath the North Pole. The audio recording then captures the activity in the Control Room as the ship surfaces at the North Pole for the very first time. – February 9, 1960

VIDEO—DVDs & Video CDs

- DVD # 002** **NAUTILUS Operation Sunshine & NAUTILUS at the Top of the World**
1 DVD

Original NAUTILUS Polar footage and documentary of North Pole Voyage
- DVD # 006** **USS SEADRAGON (SSN 584) Polar Cruise**
1 DVD

Official US Navy film footage converted to DVD- no audio
- DVD # 007** **USS SARGO (SSN 583) Goes to the Pole**
1 DVD

Official US Navy film footage converted to DVD- no audio
- VID CD # 001** **USS SARGO (SSN 583) at the North Pole**
1 Video CD – 45 seconds

Pathé newsreel clip of PARGO surfaced at the North Pole.
- DVD # 008** **USS SKATE (SSN 578) & USS SEADRAGON (SSN 584) Rendezvous at the Pole**
1 DVD

Official US Navy film footage converted to DVD- no audio

VIDEO—VHS Tapes

- Video # 0092** **USS NAUTILUS Voyage Under the North Pole 1958**
1 videocassette— ½” VHS – U.S. Navy

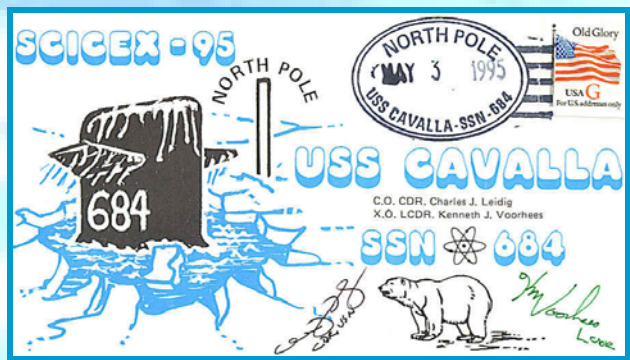
Notes: 15 minutes, silent, b&w
- Video # 0208** **Operation Sunshine**
1 videocassette— ½” VHS – U.S. Navy

Notes: 14 minutes, b&w
- Video # 0284** **Simon Lake Films – Wilkins’ “Nautilus” North Pole Expedition**
1 videocassette—1/2” VHS

Contents include fitting out and expedition footage from; Hearst Metrotone Newsreel – Paramount Studios Newsreel – Pathé Newsreel – Universal Newspaper Newsreel.

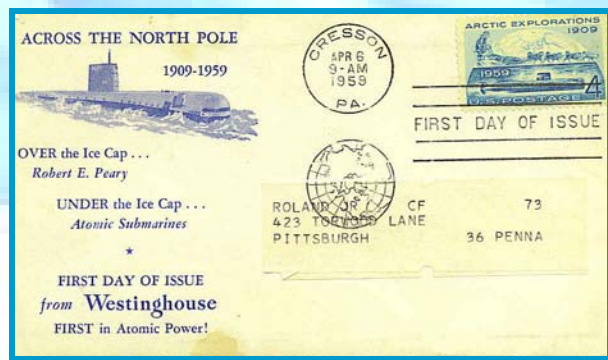
Memorabilia

Cachet Collection



Cachet

Design stamped or printed on an envelope to commemorate the events of a particular day or a famous personality in history.



First Day Covers

An envelope marked so as to indicate that it was mailed on the first day of issue of the stamp it bears, and from one of the cities at which the stamp was issued.

Unique cachet envelopes and first day covers commemorate the following submarine voyages to the North Pole:

NAUTILUS (SSN 571)

“1st Time in History—Across the North Pole” -- August 3, 1958

“Arctic Explorations 1909 & 1959” – April 6, 1959 – 1st day of issue commemorative stamp featuring Robert E. Peary and USS NAUTILUS (SSN 571)

SKATE (SSN 578)

“SEADRAGON – SKATE First rendezvous at the Pole” – August 1962

SARGO (SSN 583)

“North Pole – 1960”-- February 9, 1960

SEADRAGON (SSN 584)

“First Submerged Northwest Passage” – August 1960

“SEADRAGON – SKATE First rendezvous at the Pole” – August 1962

WHALE (SSN 638)

“North Pole” – April 6, 1969

ASPRO (SSN 648)

“PACSUBICEX 2-85” – Summer Rendezvous at the Pole – August 20, 1985
ASPRO & QUEENFISH (SSN 651)

GURNARD (SSN 662)

“Rendezvous at the Top of the World” – November 1984

GURNARD & PINTADO (SSN 672)

PINTADO (SSN 672)

“Pintado Polar Exploration – 1978” -- October 10, 1978

ARCHERFISH (SSN 678)

“SCICEX 1997” -- September 5, 1997

Correspondence from the Pole



4 Sept 60
Dear Mom & Dad,
You'll have heard from me before
this letter reaches you but you
can at least keep this letter
because the ship is worth
money.
Right now they are moving
that were off the coast of Russia
and Alaska in the Chukchi Sea.
I got of Mass cooking and am sitting
in the Yeoman office now.
I've got quite a few pictures
of our trip. They are about
icebergs, glaciers, and of our
baseball game at the North
Pole. We had quite a ball
then. Tomorrow we plan to
be in Nome, Alaska about
10:00 in the morning.
It will be 1:00 PM
in Connecticut.
We just put
a speaker in
our office today
now we can
listen to the
file box.



The museum is fortunate to have a small collection of cachets that contain original correspondence from submarine crewmembers and ship's Captains, written to friends or loved ones while the boat was at the North Pole. These letters provide a unique glimpse into the more personal side of submarine history.

The Archives contains letters from crewmembers from the following boats:

NAUTILUS (SSN 571)

“1st Time in History—Across the North Pole” -- August 3, 1958 – *3 letters from crewmembers*

SKATE (SSN 578)

“Polar Cruise – Winter ‘59” – March 17, 1959 – *2 letters from ship's Captain*

“SEADRAGON – SKATE 1st rendezvous at the Pole” – Aug 1962 – *1 letter from ship's Captain*

SEADRAGON (SSN 584)

“First Submerged Northwest Passage” – August 1960 -- *1 letter from crewmember*

“SEADRAGON – SKATE 1st rendezvous at the Pole” – Aug 1962 – *1 letter from ship's Captain*

ASPRO (SSN 648)

“1st Winter Rendezvous at the North Pole” – November 1982 – *1 letter from ship's Captains*

ASPRO & TAUTOG (SSN 639)

RAY (SSN 653)

“1st Three Ship Rendezvous at the Pole” – May 1986 -- *1 letter from ship's Captains*

RAY, HAWKBILL (SSN 666) & ARCHERFISH (SSN 678)

GURNARD (SSN 662)

"Bicentennial Polar Expedition – 1976" – April, 14, 1976 – 2 letters from ship's Captain

HAMMERHEAD (SSN 663)

"North Pole – Nov '70" – November 20, 1970 – 1 letter from ship's Captain

ARCHERFISH (SSN 678)

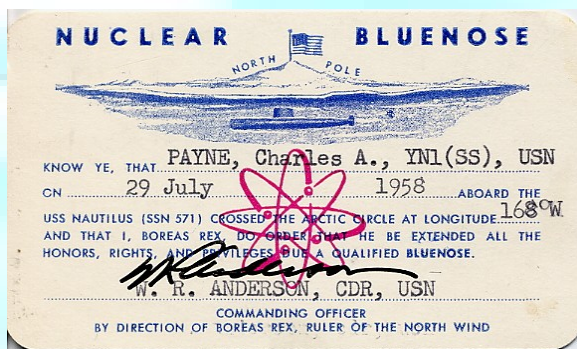
"North Pole – April 1979" – April 21, 1979 – 1 letter from ship's Captain

SILVERSIDES (SSN 679)

"ICEX-81" – October 11, 1981 – 1 letter from ship's Captain

Certificates

Order of the Nuclear Bluenose: **Wallet card – image available in USS NAUTILUS boat book Vol: Jan – Aug 12, 1958**



Realm of the Arctic Circle: Certificate – original certificate stored in oversized storage (call ahead to view)



H3.73 B635	Blair, Clay. <u>Hitler's U-boat War: The Hunters</u> 1939-1942. New York: Random House, 1996. 809 p : illus. LC 96-2275. ISBN 0-394-58839-8
H3.73 B635	Blair, Clay. <u>Hitler's U-boat War: The Hunted</u> 1942-1945. New York: Random House, 1998. 909 p : illus. LC 96-2275. ISBN 0-679-45742-9
H3.73 B838	Brennecke, Jochen. <u>The Hunters and the Hunted</u> . New York: W.W.Norton & Co., 1957. 320 p : illus. LC 58-13949.
H3.73 D683	Doenitz, Karl. <u>Memoirs: Ten Years and Twenty Days</u> . London: Weidenfeld & Nicholson, 1959. 500 p.:illus.
H3.03 T323	Terraine, John. <u>The U-boat Wars 1916-1945</u> . New York: G.P. Putnam's Sons, 1989. 841 p.:illus.



Great Britain

On March 3, 1971, Great Britain's first nuclear submarine, HMS DREADNOUGHT (S 101) became the first of several British submarines to reach the North Pole.

Since then the British Navy has maintained an interest in under-ice capabilities and several additional British submarines have made voyages to the Arctic, often operating jointly with U.S. submarines.

Some of the announced operations include:

- 1961** FINWHALE (S 05) – Carried out 28 day patrol, some of which was under the Arctic icecap.
- 1963** GRAMPUS (S 04) – Carried out further operations under Arctic ice pack.
PORPOISE (S 01)
- 1964** OTTER (S 15) – Completed patrols under Arctic ice pack.
NARWHAL (S 03)
- 1971** DREADNOUGHT (S 101) – March 3rd – First British submarine to surface at the North Pole.
- 1976** SOVEREIGN (S 108) – October 20 – surfaced at the North Pole as part of 'Operation Brisk' in exercises designed to test the submarine's cold-water navigational, equipment, and operational capabilities.
- 1987** SUPERB (S 109) – May 18 – surfaced at the North Pole in company with U.S. submarines BILLFISH and SEA DEVIL sending the signal 'On top of the world!' The reply from Operational Headquarters: 'Steer South.'
- 1987** TURBULENT (S 87) – Conducted coordinated under-ice trials of the Tigerfish Mk24 Mod2 torpedo.
SUPERB (S 109) Surfaced at the North Pole.
- 1989** TIRELESS (S 88) – Conducted operations in the Arctic
- 1991** TIRELESS (S 88) – Conducted joint Arctic operations with USS PARGO (SSN 650)
- 1992** TRENCHANT (S 91) – Conducted Arctic operations
- 1996** TRAFALGAR (S 107) – September – Scientists from Scott Polar Research Institute & Scottish Association for Marine Science on board for British version of American SCICEX.



HMS SUPERB

2004 TIRELESS (S 88) – April 19 – ICEX-04 with USS HAMPTON (SSN 767), 1st multi-national surfacing at the Pole since 1991. TIRELESS hits massive iceberg during an exercise

2007 TIRELESS (S 88) – Conducted testing in the Arctic at APLIS 2007 Ice Camp along with USS ALEXANDRIA (SSN 757), suffers the loss of two crewmen after an explosion on board the boat.



HMS TIRELESS

The following books and files provide information on British submarine Arctic operations:

Books:

E0.1 Preston, Anthony. The Royal Navy Submarine Service: A Centennial History.
P937 London: Conway Maritime Books, 2001. 192 p.: illus. ISBN 0 85177 891 7

Vertical Files:

Foreign Submarines— Great Britain

- Accidents
- Polar Operations
- Porpoise Class
- Oberon Class
- Dreadnaught Class
- Swiftsure Class
- Trafalgar Class



Soviet Union/Russia

The Russians had long operated under the edge of the Arctic ice pack and under ice in the Baltic and Far East, however the advent of nuclear power enabled them to venture anywhere in the Arctic.

In 1962, four years after America's first nuclear submarine USS NAUTILUS (SSN 571) reached the North Pole, becoming the first ship in history ever to do so, a Russian submarine "Leninsky Komsomol," the first Soviet nuclear submarine, also surfaced at the Pole. In 1967, on a return trip to the Pole it would suffer a fire while under the ice, claiming the lives of 39 of its crew.

Throughout the Cold War, Soviet submarines undertook Arctic operations on a regular basis, claiming to have made over 300 submarine visits to the Polar region.

Some key dates include:

1959 "Leninsky Komsomol" K-3 – November – carried out first Soviet naval mission under the ice, returning to base without reaching the Pole due to damage to periscope, lack of experience, and faulty ice monitoring instruments.

1962 "Leninsky Komsomol" K-3 – July 17, 1962 – reaches the North Pole and surfaces close to it.



"Leninsky Komsomol"

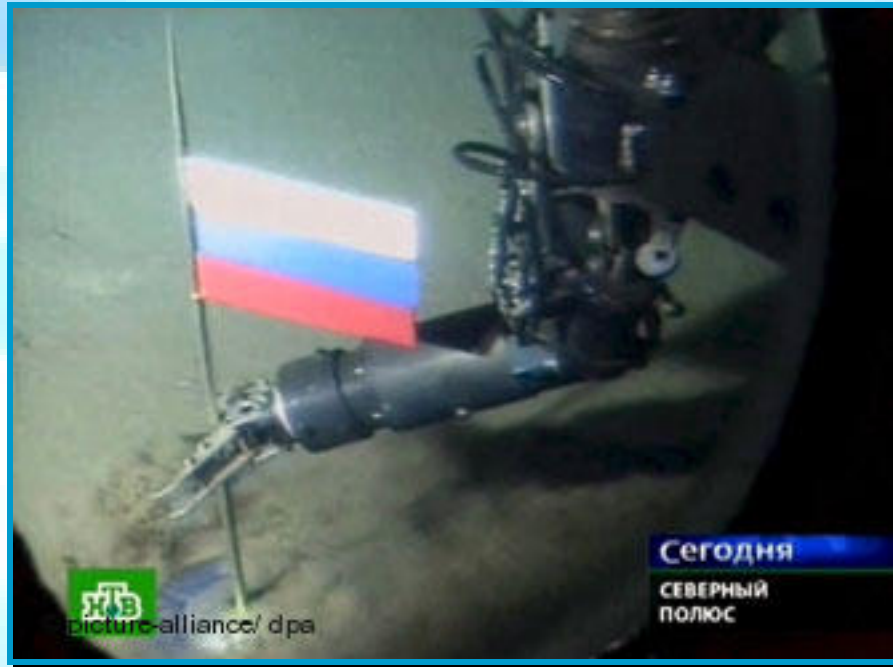
1963 K-115 – September 1963 – transited from its base in the Atlantic under the polar ice cap to the Pacific fleet for the first time.

K-178 – September 1963 – duplicates K-115 voyage, ten days later, surfacing in the ice several times

K-181 – September 29 – surfaced in the region of the North Pole.

1979 K-513 – August–September – 1st Soviet multi-submarine mission under the Arctic ice pack.
K-320 Two missile submarines operate jointly under the ice.

- 1994** K-18 & B-414 – joint Soviet submarine surfacing at the geographic North Pole.
- 1981** K-517 – August-September – completed autonomous cruise in the Arctic, surfacing 17 times, including at the North Pole.
- 2007** August – Two Russian mini-submarines dove two miles under the Arctic ice to plant a Russian flag made of titanium on the seabed. The government of Vladimir V. Putin claims that the seabed under the North Pole is an extension of Russia's continental shelf and therefore Russian territory.



The following books and files provide information on Soviet/Russian submarine Arctic operations:

Books:

- H3.74 Kolyshkin, Ivan. Submarines in Arctic Waters (Memoirs). Translated from the Russian by David Skvirsky. Moscow: Progress Publishers, 1966. 252 p.
- H3.84 Weir, Gary E. & Walter J. Boyne. Rising Tide: The Untold story of the Russian Submarines that Fought the Cold War. New York: Basic Books, 2003. 354 p.: illus. ISBN 0-465-09112-1

Vertical Files:

Foreign Submarines—Russia

Arctic Operations
November Class

Exhibits at the Submarine Force Museum

Great Submarine Voyages



Description: Photographs, text, and maps describing significant submarine polar voyages.

Location: 1st floor; lighted wall panel

Greetings from the North Pole



Description: Photographs, text, and artifacts relating to submarine polar exploration.

Location: 1st floor; inner hall exhibit case

USS SKATE (SSN 578)



Description: Temporary exhibit focusing on the history of USS SKATE (SSN 578), the first submarine to surface at the North Pole. Exhibit includes the flag made aboard the ship commemorate the historic voyage.

Location: 1st floor; west end temporary exhibit case

Uncharted Waters: Nautilus 90 North



Description: Never-before-seen color photographs and artifacts from NAUTILUS' under ice ventures. The documentary film "Operation Sunshine," produced by the Navy shortly after the voyage runs constantly in the exhibit room. Temporary exhibit runs through April 2009.

Location: 1st floor East theater/temporary exhibit room

Links to On-line Resources

USS NAUTILUS (SSN 571) Links

NavyTV—"Operation Sunshine"

Navy TV is an internet television network dedicated to the men and women of the Navy - past, present and future. Created by the United States Navy Memorial, but available for all to access, the goal of NavyTV is to tell the full story of Navy men and women. The Naval History section of the web site includes historic Navy films including "Operation Sunshine." This vintage 1958 film, narrated by Edward Murrow, documents the first voyage by the nuclear submarine USS Nautilus as it travels from the Pacific to the Atlantic by way of the North Pole.

<http://www.navytv.org/search.cfm?searchField=Operation+sunshine&submit=Search>

Dwight D. Eisenhower Presidential Library

The Dwight D. Eisenhower Presidential Library and Museum is part of the presidential libraries system administered by the National Archives and Records Administration. As President during the time NAUTILUS was launched (First Lady Mamie Eisenhower was the ship's sponsor), and as a key figure in NAUTILUS voyage to the North Pole, President Eisenhower's official papers include many references to the boat. The manuscript archives at the Library contain several 'on-line' documents relating to NAUTILUS North Pole voyage.

<http://www.eisenhower.archives.gov/dl/Nautilus/Nautilusdocuments.html>

USS NAUTILUS Alumni

Alumni web site contains several references to the North Pole voyages of 1957 and 1958 and the historic crossing of the Pole on August 3, 1958. Included on the site is a list of all crewmembers who made the crossing.

<http://users.gotsky.com/rcave/>

Assorted Arctic Submarine Links

Arctic Submarine Lab

The U.S. Navy's central-point-of-contact for planning preparation for submarine arctic missions, the Lab advises the Commanding Officers of Arctic-deployed submarines in the areas of arctic safety, environment, procedures, communications, and special equipment. Its civilian scientists assist in the development and testing of new high-frequency sonar systems and operating procedures, as well as the development and testing of submarine arctic operating procedures. The Lab also provides training for submarine crews before and during arctic missions

<https://www.csds5.navy.mil/asl/index.htm>

ICE RUN: Submarine to the Arctic – CNN Special Report

On its final mission, the nuclear submarine USS HAWKBILL journeyed underneath the polar ice cap. The mission, a joint expedition of the U.S. Navy and the National Science Foundation, navigated the treacherous waters and ice canals above the Arctic Circle. Along with the scientists and submariners, a two-person CNN crew came aboard the Hawkbill to film a documentary on the unusual environment of a cramped submarine. Web site includes first person accounts by the CNN reporter, the ship's Captain, and a civilian scientist. It also includes video clips, and IPIX images of HAWKBILL.

<http://www.cnn.com/SPECIALS/2001/icerun/index.html>

USS Hawkbill's SCICEX 99

This site contains a running diary produced by researchers on board HAWKBILL during the 1999 mission.

<http://www.csp.navy.mil/scicex/>

SCICEX (Scientific Ice Expeditions)

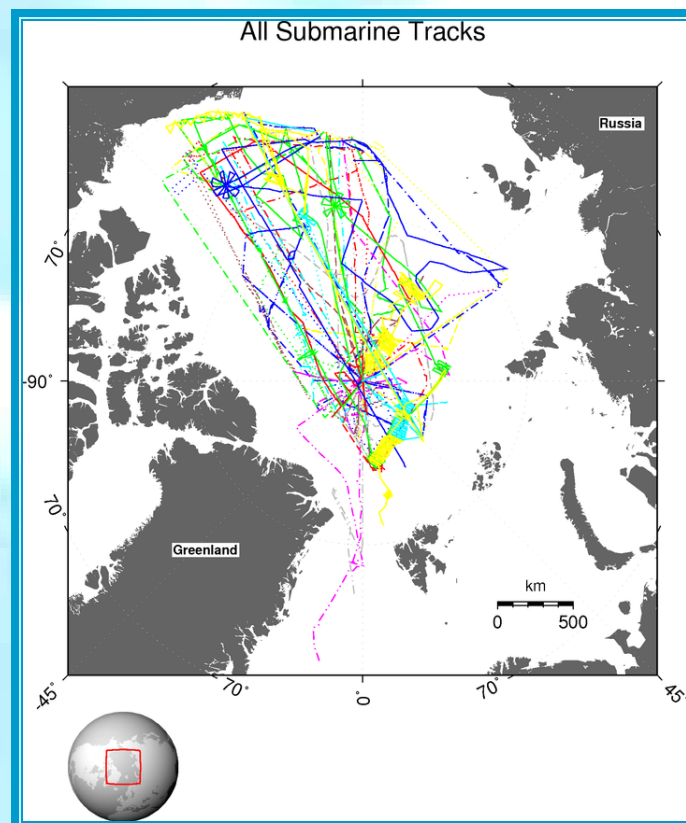
This Columbia University Web site has detailed information from all of the SCICEX missions.

<http://www.ldeo.columbia.edu/res/pi/SCICEX/index.html>

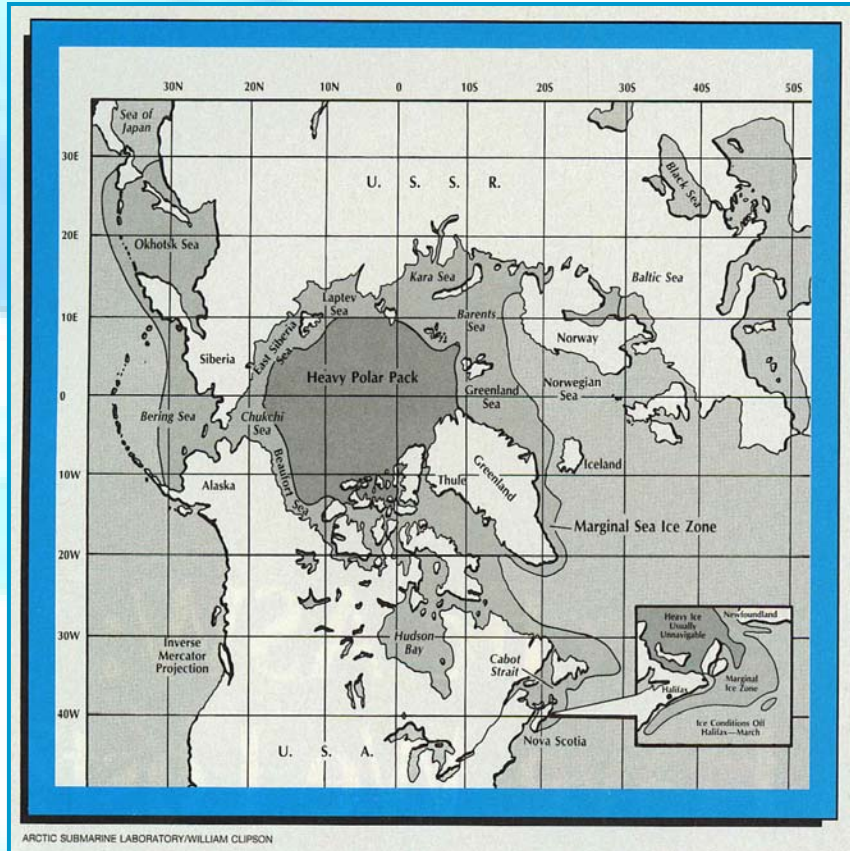
Submarine Upward Looking Sonar Ice Draft Profile Data and Statistics

This site maintained by The National Snow and Ice Data Center, (a part of the Cooperative Institute for Research in Environmental Sciences at the University of Colorado at Boulder), contains a report of upward looking sonar draft data collected by submarines in the Arctic Ocean. It includes data from both U.S. Navy and Royal Navy submarines. Maps showing submarine tracks are available.

http://nsidc.org/data/docs/noaa/g01360_upward_looking_sonar/index.html



U.S. Arctic Submarine Operations

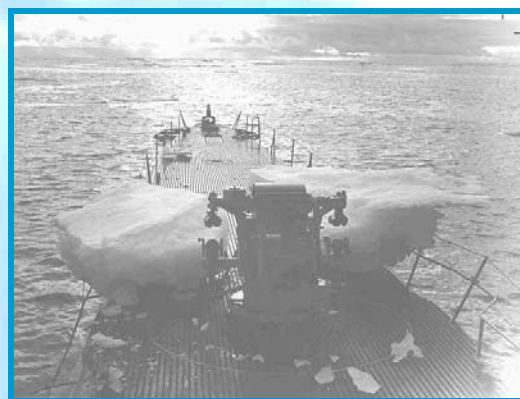


The following chronology, compiled from records of the Arctic Submarine Laboratory chronicles the Navy's announced Polar explorations and operations

1940s	1950s	1960s	1970s	1980s	1990s	2000s
1946	USS ATULE (SS 403) USS SENNET (SS 408)					operated in the Kane Basin in support of Operation Nanook Antarctic Ocean - conducted Operation Highjump
1947	USS BOARFISH (SS 327)					conducted first under-ice dives (Chukchi Sea)
1948	USS CARP (SS 338)					operated in the Chukchi Sea
1949	USS BAYA (SS 318)					conducted joint U.S. - Canadian scientific expedition in the Bering and Chukchi Seas



BOARFISH (SS 327) – 1947



CARP (SS 338) – 1948

	1940s	1950s	1960s	1970s	1980s	1990s	2000s
1950		USS PERCH (APSS 313)	and USS BARBERO (SS 317) conducted a joint reconnaissance patrol and simulated amphibious raid in Bering Sea				
1952		USS REDFISH (SS 395) USS GREENFISH (SS 351)	operated in the Beaufort Sea				
1953		USS REDFISH (SS 395)	operated in the Beaufort Sea				
1957		USS NAUTILUS (SSN 571) USS TRIGGER (SS 564)	operated in the Greenland Sea and Arctic Ocean. Gyrocompass failure at 87 North forced mission termination before reaching the North Pole operated near and under the ice pack (61 NM under ice canopy) in Northern Greenland Sea and Arctic Ocean escorting the USS NAUTILUS (SSN 571)				
1958		USS HALFBEAK (SS 352) USS NAUTILUS (SSN 571) USS NAUTILUS (SSN 571) USS SKATE (SSN 578)	operated in the Denmark Strait and Greenland Sea OPERATION SUNSHINE I - made first attempt at a trans-polar crossing but aborted due to heavy ice in the Bering Strait OPERATION SUNSHINE II - conducted the first trans-polar crossing and included first use of inertial navigation system operated in the Arctic Ocean and conducted first surfacing in openwater polynyas, also reached North Pole				
1959		USS SKATE (SSN 578) USS TROUT (SS 566) USS HARDER (SS 568)	conducted first through-ice surfacing at the North Pole operated in Cabot Strait, setting a record for distance traveled under ice for a diesel-electric submarine operated in Cabot Strait				



USS SKATE (SSN 578), 1st submarine to surface at the North Pole

	1940s	1950s	1960s	1970s	1980s	1990s	2000s
1960		USS SARGO (SSN 583) USS SEADRAGON (SSN 584) USS TUSK (SS 426) USS BANG (SS 385) USS TENCH (SS 417)	conducted first winter transit of Bering Strait, explored Chukchi and Beaufort Sea and surfaced at North Pole conducted first submerged transit of the Northwest Passage and surfaced at the North Pole conducted a joint exercise in the Gulf of St. Lawrence conducted a joint exercise in the Gulf of St. Lawrence conducted a joint exercise in the Gulf of St. Lawrence				
1961		USS BECUNA (SS 319) USS DOGFISH (SS 350) USS HALFBEAK (SS 352)	operated in Cabot Strait operated in Cabot Strait operated in Cabot Strait				
1962		USS SKATE (SSN 578) USS ENTEMEDOR (SS 340) USS TUSK (SS 426) USS SKATE (SSN 578)	operated in Cabot Strait operated in Cabot Strait operated in Cabot Strait and USS SEADRAGON (SSN 584) conducted the first rendezvous of 2 ships at the North Pole				
1963		USS SKATE (SSN 578) USS BECUNA (SS 319) USS TENCH (SS 417)	operated in Cabot Strait operated in Cabot Strait operated in Cabot Strait				
1967		USS QUEENFISH (SSN 651)	operated in Davis Strait, the first SSN 637 Class submarine under ice				
1969		USS WHALE (SSN 638) USS PARGO (SSN 650) USS SKATE (SSN 578)	operated in the Arctic Ocean and first SSN 637 Class submarine to surface at the North Pole, 60 years to the day after ADM Peary arrived there conducted operations in the Arctic spent 24 days under ice & surfaced 20 times conducted operations in the Arctic				



SKATE (SSN 578) & SEADRAGON (SSN 584) 1st submarine rendezvous at the North Pole

1940s	1950s	1960s	1970s	1980s	1990s	2000s
1970	USS QUEENFISH (SSN 651) USS HAMMERHEAD (SSN 663) USS SKATE (SSN 578)	Siberian shelf operations, surface at the Pole conduct joint exercise in Arctic, reached North Pole conduct joint exercise in Arctic, reached North Pole				
1971	USS SKATE (SSN 578) USS TREPANG (SSN 674)	operated in Arctic Ocean Denmark Strait-Greenland Sea operations				
1973	USS HAWKBILL (SSN 666) USS SEADRAGON (SSN 584)	operated in the Bering Sea operated in the Arctic Ocean				
1975	USS BLUEFISH (SSN 675)	operated in the Greenland Sea, reached North Pole				
1976	USS GURNARD (SSN 662)	Beaufort Sea, shallow-water operations, reached North Pole				
1977	USS FLYINGFISH (SSN 673)	operated in the Arctic, reached North Pole				
1978	USS PINTADO (SSN 672)	operated in the Arctic, reached North Pole				
1979	USS ARCHERFISH (SSN 678)	operated in Baffin Bay & Nares Strait, reached North Pole				



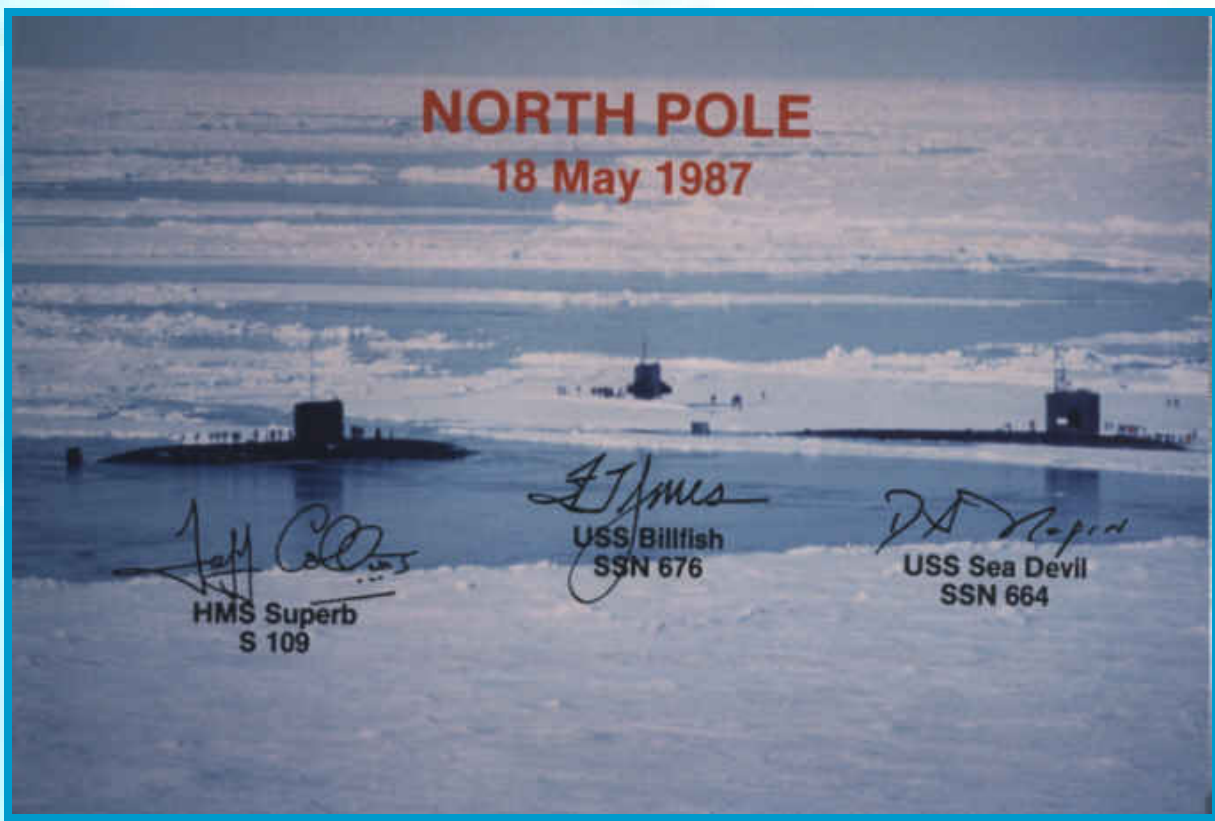
HAMMERHEAD (SSN 663) – 1970



BLUEFISH (SSN 675) – 1975

1940s	1950s	1960s	1970s	1980s	1990s	2000s
1981	USS SILVERSIDES (SSN 679)	operated in the Arctic, reached North Pole. Last under-ice mission made by Dr. Lyon.				
1982	USS ASPRO (SSN 648) USS TAUTOG (SSN 639)	conducted first 2-ship winter rendezvous at the North Pole conducted first 2-ship winter rendezvous at the North Pole				
1983	USS L MENDEL RIVERS (SSN 686) USS TAUTOG (SSN 639)	conducted operations in the Arctic conducted operations in the Arctic, 3rd ship to surface twice at the North Pole. First employment of APEX II.				
1984	USS GRAYLING (SSN 646) USS SPADEFISH (SSN 668) USS GURNARD (SSN 662) USS PINTADO (SSN 672),	conducted operations in the Arctic conducted operations in the Arctic & PINTADO 3rd pair of subs to rendezvous at the North Pole. & GURNARD 3rd pair of subs to rendezvous at the North Pole.				

- | | | |
|------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| 1985 | USS TREPANG (SSN 674) | conducted operations in the Arctic |
| | USS SEA DEVIL (SSN 664) | conducted operations in the Arctic |
| | USS QUEENFISH (SSN 651) & ASPRO (SSN 648) | conducted joint surfacing at the North Pole |
| 1986 | USS ARCHERFISH (SSN 678) | USS RAY (SSN 653), and USS HAWKBILL (SSN 666),
conduct first 3-ship rendezvous at the North Pole |
| | USS SEAHORSE (SSN 669) | conducted operations in the Arctic |
| | USS FINBACK (SSN 670) | conducted operations in the Arctic |
| 1987 | USS BILLFISH (SSN 676) | USS SEA DEVIL (SSN 664), and HMS SUPERB (S 109),
first multi-national 3-ship rendezvous at the North Pole |
| | USS PINTADO (SSN 672) | conducted operations in the Arctic |
| | USS L. MENDEL RIVERS (SSN 686) | conducted operations in the Arctic |
| 1988 | USS LAPON (SSN 661) | conducted operations in the Arctic |
| | USS ARCHERFISH (SSN 678) | conducted operations in the Arctic |
| | USS QUEENFISH (SSN 651) | celebrated 30th anniversary of OPERATION SUNSHINE by
re-tracing 1958 USS NAUTILUS (SSN 571) transpolar crossing |
| 1989 | USS STURGEON (SSN 637) | conducted operations in the Arctic |
| | USS AUGUSTA (SSN 710) | conducted operations in the Arctic |



First multi-national 3-ship rendezvous at the North Pole

1940s	1950s	1960s	1970s	1980s	1990s	2000s
1990	USS GURNARD (SSN 662) USS PUFFER (SSN 652)	and USS SEAHORSE (SSN 669) conduct joint operations in the Arctic conduct operations in the Arctic				
1991	USS PARGO (SSN 650) USS ASPRO (SSN 648) USS SEAHORSE (SSN 669)	and HMS TIRELESS (S 88), conduct joint operations in the Arctic-both subs remain on the surface for nearly 24 hours during which time they held a cricket match. and USS TAUTOG (SSN 639) conduct operations in the Arctic conducts operations in the Arctic				
1992	USS GRAYLING (SSN 646) USS SPADEFISH (SSN 668) USS PINTADO (SSN 672) USS ALBANY (SSN 753)	conducts operations in the Arctic, surfaces at the Pole CDR Richard B. Williams, conducts operations in the Arctic conducts operations in the Arctic conducted first under-ice operations by SSN 688I class boat				
1993	USS PUFFER (SSN 652) USS SPADEFISH (SSN 668) USS PARGO (SSN 650)	and USS SAN JUAN (SSN 751) joint operations. SAN JUAN conducts the first through-ice surfacing of a SSN 688I boat conducts operations in the Arctic conducted Science Ice Expedition (SCICEX) proof-of-concept Cruise				
1994	USS WHALE (SSN 638) USS PARGO (SSN 650)	conducts operations in the Arctic conducts operations in the Arctic				
1995	USS CAVALLA (SSN 684)	SCICEX 1995, conducts 360° turn through all lines of latitude to earn Magellan certificates for “round-the-world” expedition.				
1996	USS SAND LANCE (SSN 660) USS POGY (SSN 647) USS SPRINGFIELD (SSN 761)	conducts operations in the Arctic SCICEX 1996, conducted 70 day science cruise to the Arctic conducted operations in the Arctic				
1997	USS SAN JUAN (SSN 751) USS PHILADELPHIA (SSN 690) USS ARCHERFISH (SSN 678)	conducts operations in the Arctic conducts operations in the Arctic SCICEX 1997, science cruise to the Arctic				
1998	USS HAWKBILL (SSN 666) USS BILLFISH (SSN 675)	SCICEX 1998, science cruise to the Arctic conducts operations in the Arctic				
1999	USS MEMPHIS (SSN 691) USS HAWKBILL (SSN 666)	conducts operations in the Arctic SCICEX 1999, science cruise to the Arctic				



PARGO & HMS TIRELESS



PARGO 1st SCICEX



SAN JUAN 1st through ice surfacing of 688I class boat

1940s	1950s	1960s	1970s	1980s	1990s	2000s
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- 2000 USS SAN FRANCISCO (SSN 711) conducts operations in the Arctic
USS L. MENDEL RIVERS (SSN 686) conducted operations in the Arctic
- 2001 USS SCRANTON (SSN 756) and USS CONNECTICUT (SSN 22) conduct operations in the Arctic. The 1st SSN 688I Class submarine to surface at the North Pole and the 1st Arctic operations by a SSN 21 Class boat
USS OKLAHOMA CITY (SSN 723) conducted testing in the Arctic
- 2002 USS CONNECTICUT (SSN 22) conducts testing in Arctic
- 2003 USS CONNECTICUT (SSN 22) conducts testing in Arctic at APLIS 2003 Ice Camp.
USS HONOLULU (SSN 718) conducted first high-Arctic operations by first-flight 688 and first first-flight 688 to reach the North Pole.
- 2004 USS HAMPTON (SSN 767) and HMS TIRELESS (S 88), conduct 1st multi-national North Pole surfacing since 1991.
USS ALEXANDRIA (SSN 757) conducts inter-fleet transfer transiting through the Arctic.
USS OKLAHOMA CITY (SSN 723) conducts inter-fleet transfer transiting through the Arctic.
- 2005 USS MEMPHIS (SSN 691) twice conducted inter-fleet transfer transiting through the Arctic.
USS CHARLOTTE (SSN 766) conducts inter-fleet transfer transiting through the Arctic and surfacing at the North Pole.
USS SALT LAKE CITY (SSN 716) conducts inter-fleet transfer transiting through the Arctic
- 2006 USS SANTA FE (SSN 763) conducts inter-fleet transfer transiting through the Arctic.
USS SEAWOLF (SSN 21) conducts inter-fleet transfer transiting through the Arctic.
USS BOISE (SSN 764) conducts inter-fleet transfer transiting through the Arctic.
- 2007 USS ALEXANDRIA (SSN 757) and HMS TIRELESS (S 88) conduct testing in Arctic at APLIS 2007 Ice Camp.
USS CONNECTICUT (SSN 22) conducts inter-fleet transfer transiting through the Arctic.
- 2008 USS PROVIDENCE (SSN 719) enroute from the Atlantic to the Pacific 7th fleet, surfaces at the North Pole in commemoration of the 50th anniversary of the 1st submarine polar transit completed by NAUTILUS in 1958.



Polar bear gnaws on CONNECTICUT rudder



PROVIDENCE marks 50th Arctic anniversary