NSMRL provides research solutions to the most medically challenging platform in the Navy, the US Submarine. NSMRL serves the submarine fleet by taking the lead in undersea human factors, sensory sciences, and operational medicine, delivering timely evidenced-based healthcare solutions. Conveniently located at the Submarine Base New London, Groton, CT, NSMRL researchers have local access to three submarine squadrons, the Navy Submarine School, the Naval Submarine Support Facility, Naval Undersea Medical Institute, and the US Submarine Builder Electric Boat Division of General Dynamics. The laboratory is staffed by a diverse group of psychologists; audiologists; physicians; physiologists; and electrical, biomedical, and nuclear engineers. Areas of research include submariner wellness, psychological fitness, shipboard health and performance, underwater bioeffects, submarine survival and escape, and hearing protection and performance.

MISSION
Provide innovative human-centric research solutions aligned with the Submarine Force strategic direction, to sustain superiority in the undersea domain.

VISION
Focus on submarine force medical priorities and international allied partnerships to sustain advantage in the undersea domain.
Research Areas

Submariner Wellness:

NSMRL hearing conservation efforts span from basic to applied research, with the use of otoacoustic measurements to predict hearing loss, a toolkit to assist field audiologists in hearing education, and field studies onboard combat Littoral Ships. As a member of a Multi Service Partnership of the DoD Hearing Consortium, NSMRL is helping to develop an ANSI Standard for testing Hearing Protection Devices (HPDs) and Tactical Communication and Protection Systems (TCAPS).

NSMRL also conducts physical health studies including bone density/vitamin D studies on board submarines. NSMRL initiated the first-ever study of submariner epidemiology monitoring the medical impacts of the unique submarine environment.

Psychological Fitness:

NSMRL is conducting psychological screening of prospective submariners for submarine service suitability (SUBSCREEN), prediction of unplanned losses from operational units, individual and team resilience, and integration of mixed gender crews.

Shipboard Health and Performance:

NSMRL is studying submarine atmosphere effects for mixed gender crews and Submarine Atmosphere Monitoring (SAHAP) to ensure submariner health. NSMRL is studying circadian rhythm to maximize performance including evaluation of watchstanding cycles and lighting to improve vigilance, and entraining Special Forces.

Submarine Survival and Escape:

NSMRL is studying the environmental stresses encountered during submarine escape and survival, evaluating non-invasive biomarkers of pulmonary oxygen toxicity, testing and evaluating oxygen concentrators and survival hydration packs for use under environmental extremes, and developing the Submarine Rescue Manual (Guard Book) for different classes of submarine.

Underwater Bioeffects:

NSMRL is continuing underwater human factors research including high frequency underwater hearing and underwater sound location, assessing nonlethal underwater bioeffects of sound and blast, and studying diving physiology under hyperbaric stress.

Human Systems:

NSMRL is studying human perception and how to display panoramic visual data with integrated auditory cues. NSMRL is also working with command decision-making processes in submarines and evaluating team performance.