

FACT SHEET

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Naval Submarine Medical Research Laboratory Groton, CT



The Naval Submarine Medical Research Laboratory (NSMRL) is DoD's Center for Undersea Biomedical Research. The laboratory's mission is to protect the health and enhance the performance of our warfighters through focused submarine, diving and research solutions. Established in World War II, NSMRL was responsible for selecting personnel for training at the Naval Submarine School, conducting specialized training in submarine medicine for hospital corpsmen and medical officers, and researching the medical aspects of submarines and diving. Today NSMRL continues to be the biomedical R&D leader in submarine medicine, health effects of submarine atmospheres, auditory sonar information processing, selection qualification of submariners, escape and rescue from distressed submarines, diving bioeffects, and hearing conservation technology.

Sample achievements:

- Sea Lab 1 habitat project
- International Orange/air-sea rescue red
- Saturation diving and decompression tables
- Hearing conservation in noisy environments
- Safe exposure guidance for personnel operating in the presence of intense low and high frequency sonars
- Identification of submarine air constituents
- Pressurized Submarine Rescue Manual
- Data-based medical qualification policies
- Farnsworth lantern for screening color vision
- Underwater acoustic signal discrimination and classification

Located on Submarine Base New London, Groton, CT, NSMRL researchers have access to three submarine squadrons in Submarine Group Two; the Navy Submarine School; the Naval Submarine Support Facility; and the Boat Division of General Dynamics, which build's our nation's submarines. NSMRL's five multi-disciplinary research teams use highly capable facilities including their own hyperbaric and anechoic chambers, auditory and vision laboratories, diving boat and technical library.



Several colleges and universities are close nearby, including the US Coast Guard Academy, Connecticut College, and the University of Connecticut.

A healthy and highly performing Submarine Force is essential to the nation's security.

Research

Submarine Medicine

- Researchers focus on ways to optimize the health and job performance of our undersea warfighters. Their goal is to increase mission effectiveness by reducing attrition due to conditions, both psychological and physical, which may cause a submariner to be unfit for submarine service. The team represents the lead for the NAVSEA-sponsored Submarine Atmosphere Health Assessment Program.

Diving Bioeffects

- Researchers are working on ways to optimize the performance and safety of Navy divers. Their goal is to increase mission effectiveness by reducing workplace hazards and providing underwater noise-protection tools. Underwater noise can impact the diver through hearing damage and damage to internal organs, such as the lungs and brain. Research facilities include a saturation diving chamber certified to pressures simulating 350 fsw and a fully instrumented hyperbaric treatment chamber.

Hearing Conservation

- Researchers are focusing on new technology (otoacoustic emissions) to identify damage to the human ear from noise exposure. One goal is to detect pre-clinical hearing loss, before permanent hearing loss has occurred. Identification of most efficient and accurate stimuli and procedures is well along. The team is currently involved in field data collection on aircraft carrier personnel in Norfolk, VA and recruits from the Marine Corps Recruiting Depot in San Diego, CA.

Information Processing & Display

- Scientists are working to optimize the quality of information presented to Navy operators (e.g. fire control and submarine sonar consoles). Their goal is to increase mission effectiveness by decreasing operator workload and improve the human-machine interface. Displays that help the operator separate desired from undesired information will increase situation awareness, reduce workload, and improve the identification, classification and tracking of signals of interest.

Submarine Escape & Rescue

- Researcher conducts basic and applied research in the biomedical and bioengineering aspects of submarine casualties. The primary goal is to develop equipment, procedures and guidance to optimize submarine disaster survival. In addition, the team serves as a center of excellence and subject matter experts on submarine rescue and escape for the operational fleet, policy makers and industry.

Examples of Accomplishments

- Biomedical evaluations and recommendations for new submarine survival and escape equipment
- Continuous and impulsive underwater noise guidance
- Passive sampling technologies and procedures for submarine atmospheres
- Evaluations of advanced noise-reducing stethoscopes

Examples of Operational Support

- Guidance for Environmental Impact Statement to allow nation's most capable antisubmarine sonars to operate
- Development of the International Orange color (Air-Sea Rescue Red)
- SEAREX – a computer-based decision system that maximizes safety and success during escape and rescue
- Revisions to Submarine Atmosphere Control Manual
- Development of saturation diving and decompression tables
- Psychological Screening for Submarine service
- Headset assessments and recommended specifications for advanced auditory sonar systems
- Submarine Escape Action Limits for atmosphere contaminants