

# Curriculum Vitae

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**J. Morgan Wells**

## **Education**

B.S. Biology 1962  
Randolph-Macon College, Ashland, VA

Graduate Studies 1963-1964  
Virginia Institute of Marine Science  
College of William & Mary, Gloucester Point, VA

Ph.D. Physiology/Marine Biology 1969  
Scripps Institution of Oceanography  
University of California, La Jolla, CA

## **Work Experience**

1969-1972    Instructor/Assistant Professor of Physiology  
School of Medicine, University of North Carolina  
Chapel Hill, NC

                  Research Physiologist  
Institute of Marine Biomedical Research  
University of North Carolina  
Wilmington, NC

1970-1971    Adjunct Professor of Marine Biology  
University of North Carolina  
Wilmington, NC

1971-1975    Science Coordinator, Manned Undersea Science and Technology Office  
National Oceanic and Atmospheric Administration (NOAA)  
(U.S. Government)

1975-1995    NOAA Diving Coordinator

1979-1995    Director, NOAA Diving Program

1989-1995    Director, NOAA Experimental Diving Unit

1975-1995    Misc. (unpaid) positions/functions  
Visiting Scientist, US Naval Medical Research Institute  
Bethesda, MD (Contaminated Water Diving)

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## **J. Morgan Wells**

Visiting Professor of Internal Medicine  
University of Michigan (Hyperbaric Chambers & Recompression Therapy)

Guest Lecturer, US Naval Academy (Life Support Engineering)

1995 Director of Research  
Undersea Research Foundation, North, VA

### **Awards**

US Navy Meritorious Public Service Citation (actions during Sealab)

Society of American Military Engineers Colbert Medal  
(contributions to contaminated water diving)

Underwater Society of America NOGI Award (diving education)

National Association of Underwater Instructors Greenstone Award (diving safety)

### **Boards of Directors and Related Activities**

Executive Committee, Undersea and Hyperbaric Medical Society

Board of Directors, National Association of Diver Medical Technicians

Board of Directors, National Board of Diving and Hyperbaric Medical Technology

Board of Directors, Undersea Research Foundation

Board of Directors, Institute of Diving

Board of Advisors, International Association of Nitrox and Technical Divers

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### Narrative

Dr. Wells began his diving career at the age of 15 (1955) when he built an oxygen rebreather from surplus aircraft respirator parts. He used that unit for several years of diving in the ocean, rivers, lakes and under the ice.

When compressed air became available in his area, he switched to open circuit air diving and earned money teaching SCUBA diving while in college.

He received scientific diving training at Scripps Institution of Oceanography (University of California) in 1962. In 1965 he was accepted as a US Navy Sealab Aquanaut and received mixed gas and rebreather training at the US Navy Mine Defense Lab in Panama City, Florida.

Later that year, he served as a Sealab II Aquanaut during a 15-day, 205 foot helium/oxygen saturation dive, beginning a 30-year career in undersea habitat diving which has resulted in his having spent more time living on the ocean floor in undersea habitats, and having lived in more habitats than any diver on the planet. In addition to Sealab, these include TEKTITE, EDALHAB, HYDROLAB, PRINUL, HELGOLAND (Germany), and LORA (Canadian, under ice). Dr. Wells also served as operations director for special missions of HYDROLAB and HELGOLAND (in US waters).

Dr. Wells was employed by the National Oceanic and Atmospheric Administration (NOAA) from 1972 until his retirement in 1995. From 1972 until 1975 he served as science coordinator for the Manned Undersea Science and Technology Office. His duties included coordinating and conducting undersea research. In 1975 he was appointed NOAA Diving Coordinator, where he was responsible for all aspects of NOAA diving training, safety, and effectiveness. When the NOAA Diving Program was created in 1978, he was appointed director, maintaining his duties as NOAA Diving Coordinator and assuming the administrative duties of the Director. In 1989 Dr. Wells achieved the career long ambition of creating the NOAA Experimental Diving Unit (EDU). He happily left the Washington, DC area for the new NOAA EDU, and the company of the US Army Diving Detachment at Fort Eustis, VA

Dr. Wells' early research interests centered around the respiration of marine organisms as related to temperature and oxygen concentration. He used undersea habitats and diving frequently for studies of symbiotic systems of algae and invertebrates (corals, giant clams, sea anemones). His Ph.D. thesis research was on the effects of pressure on human hemoglobin oxygen binding properties. He then studied the effects of elevated nitrogen

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pressure on the oxygen binding properties of hemoglobin of humans and deep diving seals.

While working for NOAA his research work shifted to applied physiology, and technological solutions to physiological problems. He conducted research and developed equipment and procedures for diving in hot and contaminated water. He developed the NOAA Nitrox I (32% O<sub>2</sub>/N<sub>2</sub>) and II (36% O<sub>2</sub>/N<sub>2</sub>) mixtures and their respective decompression tables during the late 1970S. These mixtures have gained wide acceptance in the scientific and recreation diving communities. He increased the safety and effectiveness of NITROX preparation by designing, building, testing, and putting into operational use of the NOAA Continuous NITROX Mixer. Wells and the US Government hold the patent on this device. He later increased the effectiveness of the device by adding air separation devices (oxygen generators).

His most recent contributions to this field are the development of NOAA TRIMIX I and simple and effective methods for its preparation and the preparation of the required NITROX decompression gases.

Dr. Wells' current work (1995-1996) is related to gas separation technology and low energy consumption life support systems for long term undersea habitation.

Dr. Wells' activities in scientific and medical education remained active after his departure from his medical school faculty position. In NOAA he organized and taught (20 years) a diver medical technician (DMT) program. He assisted in the preparation of a national program in this area and currently serves on the Board of Directors of the National Board of Diving and Hyperbaric Medical Technology. In the late 1970s he designed a training program with the Undersea and Hyperbaric Medical Society, for physicians in diving and hyperbaric medicine. The NOAA/UHMS Physicians Training in Diving Medicine has been the most widely accepted civilian program on its nature in the country for over 20 years. Dr. Wells has served as course director during this time with the assistance of guest speakers who are the "cream of the crop." The Undersea and Hyperbaric Medical Society currently coordinates the course, and Dr. Wells has continued as course director after his retirement from NOAA.

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## **Diving Qualifications** (condensed)

Scripps Institution of Oceanography, 200 ft. air diving

US Navy, Mixed Gas MK VI Rebreather

General Electric, Closed Circuit Mixed Gas Rebreather

Biomarine, Closed Circuit Mixed Gas Rebreather

NOAA, Master Diver, Recompression Chamber Supervisor,  
Mixed Gas Supervisor, Diver Medical Technician (DMT),  
Oxygen Rebreather Diver

NAUI, Instructor

IANTD, Instructor

NBDHMT, DMT Instructor

## **Diving Unit Publications**

*The NOAA Diving Manual*, United States Department of Commerce, National Oceanic and Atmospheric Administration (NOAA). Manned Undersea Science and Technology Office, Washington, DC 1975 Contributor and Reviewer.

*Coral-Algal Associations: Capacity for Producing and Sustaining Elevated Oxygen Tenions in Situ.*, D'Aoust, B.G., R. White. J.M. Wells, and D.A.A Olsen, Undersea Biomedical Research Vol. 3, No. 1: 35-40, 1976

*Hydrostatic Pressure and Hemoglobin Oxygenation*, Underwater Physiology V. Ed. C.J. Lambertsen, Bethesda: Federation of American Societies for Experimental Biology, 443-448, 1976

*Assessment of 32% O<sub>2</sub> in N<sub>2</sub> Diving Tables by Means of Ultrasonic Doppler Monitoring*, Dunford, R., R. Cooper, M. Wells, and B.G. D'Aoust, Undersea Biomedical Research Supplement Vol. 6, No. 1: 17, 1979

*The NOAA Diving Manual*, Ed. James W. Miller, 2<sup>nd</sup> ed. United States Department of Commerce, NOAA. Manned Undersea Science and Technology Office, Washington, DC 1979 Contributor in areas of diving physiology and saturation diving

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*Protection of Divers in Water Containing Hazardous Chemicals, Pathogenic Organisms and Radioactive Materials*, Workshop. Undersea Medical Society, Bethesda, Nov. 1982

*Protection of Divers in Water Containing Hazardous Chemicals, Pathogenic Organisms and Radioactive Material*, Introduction, Ed. William E. Lotz, Undersea Medical Society, Bethesda 1983 3-4

*Modification of the Drager Constant Volume Suit for Polluted Water Diving*, Protection of Divers in Water Containing Hazardous Chemicals, Pathogenic Organisms and Radioactive Material, Ed. William E. Lotz, Undersea Medical Society, Bethesda, 1983 285-295

*The Medical and Physiological Implications*, Protection of Divers in Water Containing Hazardous Chemicals, Pathogenic Organisms and Radioactive Material, Ed. William E. Lotz, Undersea Medical Society, Bethesda, 1983 349-350

*Diving in Waters Containing Hazardous Materials*, Proceedings of the Seventh Meeting of the United States-Japan Cooperative Program in Natural Resources (UJNR) Panel on Diving Physiology and Technology at Tokyo Medical and Dental University, Nov. 1983, 279-285, Tokyo, Japan, Marine Science and Technology Center, 1983

*Summary of On-Scene-Coordinator Protocol for Contaminated Underwater Operations, Hazardous Materials Underwater Recover Demonstration*, Aug. 1984, 1.13-13.13

*Equipment Innovations Cut Risks for Divers in Polluted Waters*, Sea Technology, Dec. 1984

*NOAA Field Recompression Chambers*, Triage, Jan. 1985 No. 9, 7

*The NOAA Page: Nitrox – Uses and Abuses*, Triage, April 1985 No. 10, 1

*Diving Operations in Heated/Contaminated Water*, Proceedings of the Eighth Meeting, UJNR Panel on Diving Physiology and Technology, Washington, DC and Honolulu, Hawaii, June 6-17, 1985, p. 179-183. Washington, DC: US Dept. of Commerce, NOAA 1986

*Biomechanical Assessment of MK 12 Dive System, NOAA Modification for Anti-Contaminant Use in Contaminated Waters*, Proceedings, Eighth Meeting UJNR Panel on Diving Physiology and Techonogy, with Arthur J. Bachrach and Glen H. Egstrom, 197-207

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*Range of Motion Studies of Anti-Contaminant Diving Dress, Oceans 85, Vol. 2, Glen H. Egstrom, Arthur J. Bachrach and J. Morgan Wells, 1985 956-958*

*Diver Hyperthermia in Heated/Contaminated Water, Triage, June 1986 No. 13, 5, 8 and 10*

*12<sup>th</sup> NOAA Physicians Hyperbaric Training Program Scores High Marks in Miami, Florida, , Triage, Dec. 1986 No. 14, 2*

Inventor, J. Morgan Wells, United States Patent Number 4,860,803, Continuous Nitrox Mixer. Assignee, The United States of America as represented by the Department of Commerce, Washington, DC 1988

*The Use of Nitrogen-Oxygen Mixtures as Divers Breathing Gas, Oceans 88 Proceedings, Vol. 4, 1988 1305-1308*