

Scientific Diving at The Pennsylvania State University

All persons wishing to engage in Scientific Diving conducted under the auspices of The Pennsylvania State University must first have a diving status with their home institution/organization or establish a diving status with the PSU Science Diving Program. The Science Diving Program is responsible for overseeing diving safety and establishing a prospective divers fitness to dive.

The steps required to achieve a diving status include:

• A Science Diving Medical Examination

Any physician of the divers choosing may conduct this comprehensive physical examination. The examination results must be provided to the PSU Dive Safety Officer on the PSU supplied forms for evaluation. The DSO, in consultation with a physician knowledgeable in hyperbaric medicine is the sole determiner of an individuals physical fitness to dive. The cost of this evaluation is usually the responsibility of the prospective diver unless working on a grant funded project.

• Complete the Entering Science Diver Forms Packet

This includes the:

Scientific Diving Program Diver Questionnaire

Science Diver Diving Resume

Statement of Voluntary Consent, General Release and Waiver of Liability

• Complete the Entry Skills Evaluation

The Entry Skills Evaluation consists of a written test on general SCUBA diving knowledge, and a practical skills and fitness evaluation. The practical evaluation includes swimming skills, skin diving skills and SCUBA diving skills. The University Dive Safety Officer or his designee are required to conduct this evaluation. Due to limited availability of pool time, this evaluation must be scheduled in advance.

• Review Credentials and PSU Diving Regulations

Each prospective diver is required to meet with the University Dive Safety Officer or his designee to review their diving credentials and understand the policies and procedures involved in diving under the auspices of The Pennsylvania State University.

• Sign the Scientific Diving – Safe Diving Practices Form

Once the entire diver packet is completed, the diver, and the University Dive Safety Officer will sign the 'Entry Procedures' Form and the UDO will assign the individual a diving status.

The required forms and additional information are available from :

PSU Science Diving Program

2217 EESB

University Park, PA 16802

Ph (814) 865-2213

or on the Internet at: <http://www.ems.psu.edu/sciencediving>

REV 09/08

PSU DIVER QUESTIONNAIRE

Social Security #: _____ - _____ - _____ Date: _____

Last Name: _____ First Name _____ MI _____

Local Address: _____
(# and Street) (City) (State) (ZIP)

Local: HOME Phone # _____ WORK Phone # _____

Occupation: _____ Date of Birth ____/____/____ Gender: _____

E-Mail Address _____@_____

Permanent Address: _____
(# and Street) (City) (State) (ZIP)

EMERGENCY INFORMATION: In case of an emergency, whom should we contact?

Name: _____ Relationship: _____

Home Phone # (_____) _____ Work Phone # (_____) _____

Address: _____
(# & Street) (City) (State) (ZIP)

Your Doctor:
Name: _____ Office Phone No.:(_____) _____

Office Address: _____
(# & Street) (City) (State) (ZIP)

Health Insurance Carrier:

Name: _____ Phone No.: _____

Address: _____
(# & Street) (City) (State) (ZIP)

Univ. Status: (circle one) F S J Sr. Grad. (MS PHD) Staff Faculty

Major: _____ Dept.: _____ Major Professor: _____

SCIENTIFIC DIVERS MUST COMPLETE A DIVER RESUME IN ADDITION TO THIS QUESTIONNAIRE

Complete this form and return it to:

PSU Science Diving Program
2217 EESB
University Park, PA 16802

Telephone:

814-865-2213

e-mail:

tsw113@psu.edu

WWW:

<http://www.ems.psu.edu/sceincediving>

(Rev. 09/2008)

Application for Diving Certification - Diving Resume
The Penn State Science Diving Program

Name _____ Program Entry Date _____ Date of Birth _____

Date of Last Physical _____ Date of Last Chest x-ray _____ Date of Last EKG _____

Are there any medical conditions that limit your diving? _____ Yes _____ No. If yes, explain on back of form.

Have you ever suffered a diving accident (hyperbaric trauma, gas embolism, decompression sickness)? If yes, explain on back of form.

Certifications:

Attach copies of certification cards or records of training, record agency, type, and year below

Basic diving certification _____ CPR _____ First Aid _____

Oxygen Admin. _____

Specialty Certifications _____

Career Open-Water Dives (estimate):

Dives _____ # Hours _____ Max. Depth.(fsw) _____ Date & Depth (fsw) of last dive _____

Self-imposed depth limit _____

Indicate your diving experience in the following categories:

E=Extensive (>20) Moderate (5-20) Limited (1-4) N=None

Diving From Boats/Ships:

_____ Small Boats (up to 20')

_____ Vessels 21'-100'

_____ Ships >100'

Other:

_____ Night Diving

_____ Decompression Diving

_____ Diving at Sea (Blue Water)

_____ Diving EMT/Chamber Operator

_____ Cold Water (<45°F) Diving

_____ Turbid Water (0-5' visibility) Diving

_____ Very Clear Water (>50' vis.) Diving

_____ Saltwater Diving

_____ Mud or Silt Bottom Diving

_____ Kelp Forest Diving

_____ Coral Reef Diving

_____ Current (>½ knot) Diving

_____ Altitude (>2000') Diving

_____ Dry Suit Diving

_____ Nitrox/Enriched Gas Diving

_____ Commercial/Military/Scientific Diving

_____ Surface-Supplied Diving

_____ Saturation Diving

_____ Towed Diving

Shore Diving:

_____ Rocks or "Ironshore"

_____ Surf

Overhead Environments Diving:

_____ Ice Diving

_____ Cave Diving

_____ Cavern Diving

_____ Wreck Diving

Freshwater Diving:

_____ Ponds, Lakes, Quarries

_____ Rivers

Research Diving Experience

Level of Experience _____ Examples of Research Diving Projects _____

I acknowledge that I have read and understand the PSU Standards for Scientific Diving, and that the information that I have provided is accurate to the best of my knowledge.

Signature _____ Date _____

Witness: Name _____ Signature _____ Date _____

SCIENTIFIC DIVING – SAFE DIVING PRACTICES

Your signature on this statement is required as proof that you have read the standards for scientific diving established by the Penn State Science Diving Program. Read and discuss this statement with the University Dive Safety Officer, or his/her designee, before signing. If you are a minor, this form must also be signed by a parent or guardian.

Your signature on this form acknowledges your agreement to adhere to the regulations and procedures for scientific diving detailed in the Penn State Standards for Scientific Diving.

I, _____, understand that as a scientific diver I must:

- 1) Read and understand the Penn State Dive Safety Manual.
- 2) Adhere to the regulations and procedures established for scientific diving at Penn State. This includes, but is not limited to:

- Diving within my certification limits unless on a training dive with an Active diver or instructor authorized to supervise the dive.
- Refusing to dive, or terminating a dive, if dive conditions become unacceptable.
- Reporting unsafe practices to the DSO.
- Reporting any injuries to the DSO and the proper authorities immediately, and seeking appropriate treatment.
- Abiding by basic safe diving practices: listening carefully to dive briefings, following the dive plan, maintaining proper buoyancy, never holding my breath, being proficient in dive table/computer use.
- Adhering to the buddy system (two comparably equipped scuba divers in the water in constant communication) on all scuba dives. The buddy system is based upon mutual assistance, especially in the case of an emergency.
- Carrying the appropriate equipment for every dive including an alternate air source (at least an alternate second stage, and preferably a redundant gas supply).
- Conducting a functional check of my diving equipment in the presence of my diving buddy or tender.
- Carrying out a safety stop on every dive below 60 FSW, provided I have sufficient breathing gas to reach the surface safely, and ascending slowly from every dive.
- Terminating all dives while there is still sufficient tank pressure to permit me to safely reach the surface -- including decompression if necessary.
- Ensuring that I understand the emergency evacuation procedure for each dive that I undertake, and staying current in CPR, first aid, and emergency oxygen delivery.

3) Not engage in dive activities in an underwater environment with an overhead restriction back to the surface without obtaining the appropriate advanced training and the approval of the University Dive Safety Officer.

4) Understand that I can deviate from the requirements of the Penn State Dive Safety Manual to the extent necessary to prevent or minimize a situation that is likely to cause death, serious physical harm, or major environmental damage.

Scuba diving is a potentially dangerous activity. The ultimate responsibility for safety rests with the individual diver. It is my responsibility and duty to refuse to dive if, in my judgment, conditions are unsafe or unfavorable, or if I would be violating the precepts of my training or the regulations of the Penn State Dive Safety Manual.

I have read the above statements and have had any questions answered to my satisfaction.

Participant's Signature Date

The Pennsylvania State University

Statement of Voluntary Consent
General Release and Waiver of Liability

In consideration of my participation in **SCIENTIFIC DIVING**, and for other good and valuable consideration received by me, receipt of which is hereby acknowledged,

I _____, hereby affirm that I am least eighteen (18) years of age or older, and having actual knowledge and conscious appreciation of the particular dangers involved in SCUBA DIVING and the activities described herein, including but not limited to: **COMPRESSED GAS DIVING**, do hereby volunteer consent to the my participation in the aforementioned activity and assume the risk arising therefrom, as well as hereby hold harmless and release and forever discharge The Pennsylvania State University, its Board of Trustees, the Penn State Diving Control Board, the Penn State Dive Safety Officer and any and all of its agents, officers, assistants and employees, either in their individual capacities or by reason of their relationship to the Pennsylvania State University and its Board of Trustees, and their successors, from any and all claims and demands whatsoever, which the undersigned and any of them and their heirs, representatives, executors and administrators thereof, or any other persons acting in their behalf, or in behalf of their respective agents, have or may have against the said Board of Trustees of the Pennsylvania State University, or any or all of the aforementioned persons or their successors, by reason of any accident, illness, injury or death, or any other consequences arising or resulting directly or indirectly from participation in all DIVING activities under the auspices of the Pennsylvania State University, and occurring during said participation, or at any time subsequent thereto.

I HEREBY further declare and represent that I am on notice, this being evidence and acknowledgement thereof, that The Pennsylvania State University has no medical insurance that covers me, and it has been strongly recommended to me that I obtain medical insurance and supplementary dive accident and medical evacuation insurance prior to the aforesaid **SCIENTIFIC DIVING** activities are performed.

FINALLY, I HEREBY declare and represent that in making, executing and tendering this Statement of Voluntary Consent, General Release and Waiver of Liability, I fully understand and acknowledge that I am relying wholly upon my own judgment, belief and knowledge of the circumstances involved in my participation in the described activity, and that I have read this statement, understood its contents, and executed it of my own free will and choice.

IN WITNESS WHEREOF, I have executed this instrument as of _____.
(date)

(WITNESS SIGNATURE)
(Rev. 09/08)

(SIGNATURE OF STUDENT)

THE PENNSYLVANIA STATE UNIVERSITY
Science Diving Program Entry Procedures

NAME: _____ **DATE:** _____

EVALUATOR: _____

All persons wishing to dive under the auspices of PSU must be evaluated for their fitness and ability to dive. This evaluation will be conducted by arrangement with the University Dive Safety Officer or his designee. Science divers completing this process meet the requirements of AAUS. The evaluation shall include the following:

	DATE/ BY
Review of Diving Credentials:	
a.) Diving Questionnaire completed.	_____
b.) Waiver forms completed	_____
c.) Certifications copied	_____
Written Exam:	
a.) Grade _____% (minimum passing score 80%) b.) Corrected and discussed with candidate	_____
Medical Evaluation:	
a.) Forms discussed with candidate	_____
b.) Medical approval received	_____
c.) Any physical limitations discussed with candidate NONE	_____
Skills Evaluation: (Scheduled <u>AFTER</u> passing written exam, and receiving medical clearance)	
a.) <u>Swimming Skills Evaluation (Without the use of swim aids)</u>	
1. Swim underwater for 75 feet on one breath without surfacing or using swim aids	_____
2. Swim 400 yards using at least 2 strokes in 12 minutes or less	_____
3. Tread water for 10 minutes (last 2 minutes with no hands)	_____
4. Transport a person of equal size 75 ft. at the surface without using swim aids.	_____
b.) <u>Skin Diving Skills Evaluation</u>	
1. Using only mask, snorkel & fins, surface dive to 10 ft., recover a 6 lb. weight, return to surface, and clear snorkel using only one breath.	_____
c.) <u>SCUBA Skills Evaluation (Skills Performed at the Surface)</u>	
1. Perform water entry wearing full SCUBA equipment.	_____
2. Establish positive and neutral buoyancy	_____
3. Alternate between snorkel and SCUBA while kicking	_____
4. Swim 400 yards wearing full SCUBA breathing only through snorkel.	_____
5. Recover and surface an unconscious, non-breathing diver, and perform rescue breathing while towing to exit point.	_____
6. Perform ladder exit wearing full SCUBA	_____
d.) <u>SCUBA Skills Evaluation (Skills Performed While Submerged)</u>	
1. Establish neutral buoyancy	_____
2. Remove, replace and clear face mask of water.	_____
3. Remove, relocate and clear regulator	_____
4. Buddy breath as both the donor and recipient, with and without face mask.	_____
5. Remove and replace all equipment underwater	_____
6. Simulate a swimming free ascent (CESA)	_____
7. Properly use underwater signs and signals for: OK, up, down, low on air, out of air, buddy breath, help, look and any other requested by evaluator.	_____

I have performed each of the skills listed above. I have been advised of any deficiencies and encouraged to seek additional training in identified areas of weakness.

CANDIDATE SIGN _____ **DATE** _____

The above listed person has satisfactorily demonstrated proficiency in each of the above skill areas.

Watermanship: _____ POOR _____ GOOD _____ EXCELLENT

Judgment _____ POOR _____ GOOD _____ EXCELLENT

EVALUATOR SIGN _____ **DATE** _____

DIVING MEDICAL EXAM OVERVIEW FOR THE EXAMINING PHYSICIAN

To the Examining Physician:

This person, _____, requires a medical examination to assess his/her fitness for certification as a Scientific Diver for the Pennsylvania State University. His/her answers on the Diving Medical History Form (attached) may indicate potential health or safety risks as noted. Your evaluation is requested on the attached scuba Diving Fitness Medical Evaluation Report. If you have questions about diving medicine, you may wish to consult one of the references on the attached list, or the Diver's Alert Network (DAN) at 1-919-684-2948 (www.diversalertnetwork.org). Please contact the undersigned University Dive Safety officer if you have questions or concerns about diving medicine or the Penn State standards.

Thank you for your assistance.

_____ Dive Safety Officer	_____ Date
<u>Timothy S. White</u> Name	<u>814-865-2213</u> Phone Number

Scuba and other modes of compressed-gas diving can be strenuous and hazardous. A special risk is present if the middle ear, sinuses or lung segments do not readily equalize air pressure changes. The most common cause of distress is Eustachian insufficiency. Most fatalities involve deficiencies in prudence, judgement, emotional stability or physical fitness. Please consult the following conditions that usually restrict candidates from diving.

(Adapted from Bove, 1998. Bracketed numbers are pages in Bove)

CONDITIONS THAT MAY DISQUALIFY CANDIDATES FROM DIVING

1. Abnormalities of the tympanic membrane, such as a perforation, presence of monomeric membrane, or inability to autoinflate the middle ears. [5,7,8,9]
2. Vertigo, including Meniere's Disease. [13]
3. Stapedectomy or middle ear reconstructive surgery. [11]
4. Recent ocular surgery. [15,18,19]
5. Psychiatric disorders including claustrophobia, suicidal ideation, psychosis, anxiety states, untreated depression. [20-23]
6. Substance abuse, including alcohol. [24-25]
7. Episodic loss of consciousness. [1,26,27]
8. History of seizure. [27,28]
9. History of stroke or a fixed neurological deficit. [29,30]
10. Recurring neurological disorders, including transient ischemic attacks. [29,30]
11. History of intercranial aneurysm, other vascular malformation or intercranial hemorrhage. [31]

12. History of neurological decompression illness with residual deficit. [29,30]
13. Head injury with sequelae. [26-27]
14. Hematologic disorders including coagulopathies. [41,42]
15. Evidence of coronary artery disease or high risk for coronary heart disease ¹. [33-35]
16. Atrial septal defects. [39]
17. Significant valvular heart disease – isolated mitral valve prolapse is not disqualifying. [38]
18. Significant cardiac rhythm or conduction abnormalities. [36-37]
19. Implanted cardiac pacemakers and cardiac defibrillators (ICD). [39,40]
20. Inadequate exercise tolerance. [34]
21. Severe hypertension. [35]
22. History of spontaneous or traumatic pneumothorax. [45]
23. Asthma ². [42-44]
24. Chronic pulmonary disease, including radiographic evidence of pulmonary blebs, bullae or cysts. [45,46]
25. Diabetes mellitus. [46-47]
26. Pregnancy. [56]

Selected References in Dive Medicine

Most of these are available from Best Publishing Company, PO Box 30100, Flagstaff, AZ 86003-0100, The Divers Alert Network (DAN) or the Undersea and Hyperbaric Medical Society (UHMS), Bethesda, MD.

Bove, A. and J. Davis (1997). Diving Medicine, 3rd Edition. W.B. Saunders Company, Philadelphia, USA.

Bove A. (1998). Medical Examination of Sport Scuba Divers. Medical Seminars, Inc. San Antonio, TX, USA.

Edmonds, C., C. Lowery, and J. Pennefather (1994). Diving and Subaquatic Medicine, 3rd Edition. Butterworth-Heinemann Ltd., Oxford, UK.

NOAA, NOAA Diving Manual, Superintendent of Documents, U.S. Government Printing Office, Washington, DC, USA.

U.S. Navy, U.S. Navy Diving Manual, Superintendent of Documents, U.S. Government Printing Office, Washington, DC, USA.

¹
 “Assessment of Cardiovascular Risk by Use of Multiple-Risk-Factor Assessment Equations” Grundy et al., 1999. AHA/ACC Scientific Statement. <http://www.acc.org/clinical/consensus/risk/risk1999.pdf>.

²
 “Are Asthmatics Fit to Dive?” Elliott, DH, ed. 1996. Undersea and Hyperbaric Medical Society, Kensington, MD., USA.

MEDICAL EVALUATION OF FITNESS FOR SCUBA DIVING REPORT

Name of Applicant (Print or type)

Date (Mo/Day/Year)

Please return this form (marked confidential) to: Timothy S. White, The Pennsylvania State University, 2217 EESB, University Park, PA 16802.

TO THE PHYSICIAN:

This person is an applicant for training or is presently certified to engage in diving with self-contained underwater breathing apparatus (scuba). This is an activity that puts unusual stress on the individual in several ways. Your opinion on the applicant's medical fitness is requested. Scuba diving requires heavy exertion. The diver must be free of cardiovascular and respiratory disease. An absolute requirement is the ability of the lungs, middle ear and sinuses to equalize pressure. Any condition that risks the loss of consciousness should disqualify the applicant.

Tests: Please initial that the following tests were completed.

Initial Examination	Re-Examination (Every 5 years under age 40, every 3 years over age 40, every 2 years over age 60)
Medical History	Medical History
Complete physical with emphasis on neurological and otological components	Complete physical with emphasis on neurological and otological components
Chest X-ray	
Spirometry	
Hematocrit or hemoglobin	Hematocrit or hemoglobin
Urinalysis	Urinalysis
Any further tests deemed necessary by the physician	Any further tests deemed necessary by the physician
Additional testing for initial test over age 40	
Resting EKG	Resting EKG
Assessment of coronary artery disease using ³	Assessment of coronary artery disease using ¹
Multiple-Risk-Factor Assessment (age, lipid profile, blood pressure, diabetic screening, smoker)	Multiple-Risk-Factor Assessment (age, lipid profile, blood pressure, diabetic screening, smoker)
Note: Exercise stress testing may be indicated based on risk factor assessment ⁴	

³ "Assessment of Cardiovascular Risk by Use of Multiple-Risk-Factor Assessment Equations" Grundy et al., 1999. AHA/ACC Scientific Statement. <http://www.acc.org/clinical/consensus/risk/risk1999.pdf>.

⁴ Gibbons RJ et al. ACC/AHA Guidelines for Exercise Testing. A report of the American College of Cardiology/American heart Association Task Force on practice Guidelines (Committee on Exercise Testing). Journal of the American College of Cardiology. 30:260-311, 1997. <http://www.acc.org/clinical/guidelines/exercise/exercise.pdf>.

DIVING MEDICAL HISTORY FORM

(To Be Completed By Applicant-Diver)

Name _____ Sex _____ Age _____ Wt. _____ Ht. _____

Sponsor _____ Date _____/_____/_____
(Dept./Project/Program, etc.) (Mo / Day / Yr.)

To the Applicant:

Scuba diving makes considerable demands on you, both physically and mentally. Diving with certain medical conditions may be dangerous not only for yourself, but also to anyone coming to your aid if you get into difficulty in the water. Therefore, it is prudent to meet certain medical and physical requirements before beginning a diving or training program.

Your answers to the questions are as important, in determining your fitness, as your physical examination. You must provide accurate information for the screening process to be effective.

This form shall be kept confidential. If you believe any question amounts to an invasion of your privacy, you may elect to omit an answer, provided that you subsequently discuss the matter with your own physician and he/she must then indicate, in writing, that you have done so and that no health hazard exists.

Should your answers indicate a condition that might make diving hazardous, you must review the matter with your physician. In such instances, his/her written authorization will be required in order for further consideration to be given to your application. If your physician concludes that diving would involve undue risk for you, remember that he/she is concerned only with your well-being and safety.

Please respect the advice and intent of this medical history form.

	Have you ever had or do you presently have any of the following?	Yes	No	Comments
1	Trouble with your ears, including ruptured eardrum, difficulty clearing your ears, or surgery.			
2	Trouble with dizziness.			
3	Eye surgery.			
4	Depression, anxiety, claustrophobia, etc.			
5	Substance abuse, including alcohol.			
6	Loss of consciousness.			
7	Epilepsy or other seizures, convulsions or fits.			
8	Stroke or a fixed neurological deficit.			
9	Recurring neurological disorders, including transient ischemic attacks.			
10	Aneurysms or bleeding in the brain.			
11	Decompression sickness or embolism.			
12	Head injury.			
13	Disorders of the blood, or easy bleeding.			
14	Heart disease, diabetes, high cholesterol.			
15	Anatomical heart abnormalities including patent foramen ovale, valve problems, etc.			

- 16 Heart rhythm problems.
- 17 Need for a pacemaker.
- 18 Difficulty with exercise.
- 19 High blood pressure.
- 20 Collapsed lung.
- 21 Asthma.
- 22 Other lung disease.
- 23 Diabetes Mellitus.
- 24 Pregnancy
- 25 Surgery. If yes, explain below.
- 26 Hospitalizations. If yes, explain below.
- 27 Do you take any medications? If yes, list below.
- 28 Do you have any allergies to medications, foods, environmental? If yes, explain below.
- 29 Do you smoke?
- 30 Do you drink alcoholic beverages?
- 31 Is there a family history of high cholesterol?
- 32 Is there a family history of heart disease or stroke?
- 33 Is there a family history of diabetes?
- 34 Is there a family history of asthma?

Please explain any “yes” answers to the above questions.

I certify that the above answers and information represent an accurate and complete description of my medical history.

Signature

Date