



**THE UNIVERSITY OF MAINE  
SCIENTIFIC DIVING PROGRAM**

**PROGRAM SUMMARY 2018**



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## CONTENTS

Contents.....	i
Introduction.....	1
Background.....	1
Program Elements.....	2
Program Activity.....	6
Challenges and Recommendations.....	8
Appendices	
Appendix A- Diving Operations Manager Job Description	
Appendix B1-Program Assistant Job Description (Professional)	
Appendix B2- Program Assistant Job Description (Internship)	
Appendix C- AAUS Self-Evaluation Checklist	
Appendix D- AAUS Statistics Report	
Appendix E- UMaine ‘Diving by the Numbers’	
Appendix F- Timeline of Notable Achievements	
Appendix G- Maine Scientific Diving Consortium	
Supplement 1- AAUS BOD Service Letter	
Supplement 2- NPS Dive Leader Service Letter	

## INTRODUCTION

The goal of this report is to provide University administrators, program users, and other personnel with essential information regarding the history, purpose, and functioning of the UMaine Scientific Diving Program. This report is particularly pertinent at this time as we celebrate 50 years of scientific diving activity at UMaine (1960s-present), 10 years of academic scientific diving curriculum (2008-present), and as a result of restructuring within the University of Maine System and Department of Safety Management (2017-2018). Additionally, this report is intended to provide a supplement to the ongoing discussion regarding the roles and responsibilities of the position of UMaine Diving Operations Manager/ Diving Safety Officer.

## BACKGROUND

### History and Mission

The University of Maine Scientific Diving Program supports the mission of scientists and students by facilitating the safe and efficient conduct of underwater research and education. The program has a long and distinguished history with over 50 years of activity (1960s-present). UMaine diving scientists perform work in various waters worldwide and are some of our most recognized faculty and researchers. Historically, most diving at UMaine has been conducted by researchers in the School of Marine Sciences, previously the Department of Oceanography, with the majority of diving activity occurring at the Darling Marine Center (DMC) in Walpole. While the DMC serves as the physical home of the program, various other University departments and units engage in diving activities, and as of 2017, the program supervises and supports all occupational, scientific, and recreational diving throughout the UMaine System.



*R. Steneck at Darling Marine Center (c. 1980)*

### Organization & Management

Consistent with the OSHA requirements for scientific diving [29CFR1910 Subpart T], the UMaine Diving Control Board (DCB) is responsible for oversight of the Scientific Diving Program. As defined in the federal regulations, the DCB is comprised of active scientific divers and is an independent body which retains autonomous control and oversight of all scientific diving operations. The DCB delegates management of most program elements to the UMaine Diving Safety Officer (DSO) who reports to both the DCB and the Department of Safety Management. All of these entities must interface with each other and other University departments to ensure program activities are consistent with community and regulatory standards and University policies.

### AAUS

To achieve and ensure the highest standards of practice for scientific diving activities, in 1995 UMaine adopted the standards of the American Academy of Underwater Sciences (AAUS) and became Organizational Members of this community. Adherence to AAUS standards ensures that UMaine is compliant with US federal requirements for scientific diving [OSHA 29 CFR 1910 Subpart T] as well as the more stringent and well-defined AAUS requirements, which are accepted as the recognized 'community standard' in the US and many other nations. One of only ~150 AAUS institutions worldwide, AAUS membership provides recognition for UMaine via a strong network of cooperating and similarly minded institutions. Participation in this community has raised awareness of and credibility for our programs and provides collaborative and networking opportunities for UMaine diving scientists and students.

## PROGRAM ELEMENTS

### Operational Oversight

The UMaine Diving Control Board (DCB) is responsible for oversight of the UMaine Scientific Diving Program, however, most all operational elements are delegated to the Diving Operations Manager/ Diving Safety Officer (DOM/DSO). The standards for scientific diving at UMaine are listed in the UMaine scientific diving manual ("*Standards for Scientific Diving Certification and Operation of Scientific Diving Programs*") which is approved by the DCB and implemented by the DSO.

*Diving Control Board-* the UMaine Diving Control Board is currently comprised of the individuals listed below. Per OSHA and AAUS requirements, the DCB consists of a majority of active scientific divers, most of whom are also UMaine faculty and/or researchers. UMaine maintains a separate advisory board to the DCB (A) comprised of individuals with previous scientific diving experience and/or other specialized expertise. The Director of UMaine Safety Management previously held a position on the DCB, but a replacement for this individual has yet to be identified as of 2018.

- Emmanuel Boss, PhD
- Christopher Rigaud, M.S. (DOM/DSO)
- Robert Steneck, PhD
- Richard Wahle, PhD (DCB Chair)
- Rhian Waller, PhD
- *SM representative?*
- ❖ Robert Downs, USN Ret. (A)
- ❖ Warren Riess, PhD. (A)
- ❖ Mark L. Wells, PhD. (A)

*Diving Operations Manager/Diving Safety Officer-* the UMaine DOM/DSO position is administered by and reports to the Department of Safety Management (SM). The DOM is responsible for day to day oversight of a program that serves the multi-disciplinary research and educational community of UMaine. Diving related activities require extensive training, are conducted in a wide range of environments, and carry considerable risk. The DOM is tasked to support, promote, coordinate, and supervise underwater research and related activities performed under University auspices, and to oversee the training, certification, and safety of all diving related projects, personnel, equipment, and activities at UMaine and all affiliated remote sites. The position is relatively autonomous and manages an increasing resource base, budget, and staff.

The DOM is the cornerstone of the scientific diving program. In addition to administrative and managerial responsibilities, the DOM must be an active scientific diver, diving educator, and advocate for scientific divers. Involvement in the diving and scientific communities is essential to maintaining familiarity and proficiency with current concepts, methods, and technology. The DOM supports the mission of the University by ensuring that the program acts to facilitate, not simply regulate, diving activities and provide essential opportunities for scientists, educators, and students to utilize diving in the pursuit of their goals. The DOM is responsible for a number of diving-related teaching activities, including the development of academic programming, support of marketing and outreach activities, and developing funding requests or grant proposals for the purchase of diving equipment.

The DOM position includes many functional responsibilities other than diving. A summary of the position responsibilities can be found below, the full Position Description is included in Appendix A.

- Reviews and updates scientific diving manual; ensures compliance with OSHA/AAUS standards
- Reviews and approves individual Diver Applications and Dive Plans
- Maintains individual diver records; compiles records of diving activity (Dive Logs)
- Trains scientific divers; serves as primary instructor for academic diving programs
- Liaisons with DCB, scientific divers, AAUS, and the greater scientific diving community
- Serves as DMC Hazardous Waste Mgr., Facility Emergency Coordinator, and SM Representative

## Diver Training

**SMS324-** The foundation of the UMaine Scientific Diver Training Program is our academic scientific diving course, *SMS324- Introduction to Research Diving*. The goal of the course is to provide students with the knowledge and skills to safely conduct science underwater, and is designed to meet the 100-hr minimum training requirement for scientific divers as prescribed by the AAUS. As of July 2018, the course has run 15 sessions over 11 consecutive years, trained a total of 102 scientific divers, and generated over \$80,000 in tuition (Table 1). In 2015 the course was changed from a "491-special topics" course and given full recognition as an SMS credit-bearing course. Traditionally conducted in conjunction with the SMS Semester-by-the-Sea, this course is also offered during May-term/Summer session.

*Table 1- Summary of Academic Diving Course Enrollment (2008-2018)*

Intro to Research Diving (SMS491/ SMS324)				Total Divers	Basic Scuba			
Session	Year	# Students	Credit Hrs		Session	Year	# Students	Credit Hrs
15	11	102	282	153	7	7	51	0
	<i>Annual Avg</i>	9.27	25.64			<i>Annual Avg</i>	7.29	0.00
1F	2008	5	15					
2F	2009	4	12					
3F	2010	6	18					
4F	2011	4	0					
5S		8	24					
6F	2012	10	30		1	2012	4	0
7F	2013	9	27		2	2013	7	0
8F	2014	9	27		3	2014	7	0
9S	2015	7	18		4	2015	8	0
10F		9	21					
11S	2016	6	18		5	2016	9	0
12F		10	30					
13S	2017	6	18		6	2017	7	0
14F		6	18					
15S	2018	3	6		7	2018	9	0

Prior to the existence of SMS-324, scientific diver training was conducted only on an 'as needed' and 'on-the-job' basis. This model was inefficient and did not effectively meet the standards of the scientific diving community or the needs of UMaine divers. SMS-324 supports the University's mission by ensuring that the program acts to facilitate, not simply regulate, scientific diving activities by providing standardized and accessible training and opportunities. The academic component of this occupational safety program increases its perceived significance, provides financial value to the university via tuition dollars, and is a key recruiting tool.



*C. Johns supervises students in SMS324 (Summer 2018)*

*Basic Scuba/ Discover Scuba-* in 2012, UMaine began offering entry-level scuba courses for SMS students. This course provides students the opportunity to become certified scuba divers on campus at UMaine, instead of seeking this training from the recreational community. As of June 2018, this course has run 7 sessions, and trained 51 divers (Table 1). In conjunction with our "try-dive" NFA 117-Discover Scuba sessions, Basic Scuba is a major SMS recruitment tool.

*OTJ Training and Support-* in addition to scheduled academic programming, the program continues to offer on-the-job training (OTJ), guidance, and supervision for UMaine researchers, diving interns, visiting scientists, and others who require the use of scuba diving as a research tool. Examples include:

- Supervision/support for UMaine and visiting dive teams
- Ongoing training
  - CPR/First Aid training
  - Deep/extended range diving
  - Drysuit diving
  - Enriched air nitrox
- Support of courses that incorporate diving
  - SMS-531Coral Reefs (R. Steneck)



*UMaine Basic Scuba Students (June 2018)*



*C. Rigaud joins B. Favitta and C. Huntsberger for dive field audit (June 2018).*



*R. Waller and C. Rigaud train for deep coral exploration dives (2012).*

## Program Resources

*Equipment-* the scientific diving program currently maintains a cache of equipment necessary to run an effective and safe scientific diving program:

- DMC Dive Locker
- Air Station and Compressor
- Emergency Response equipment
  - AED (x1)
  - First Aid & Oxygen kits (x5)
- Scuba equipment
  - Scuba cylinders (~40)
  - BCDs, regulators, computers, weights (x10 full sets)
  - Masks, snorkels, fins
  - Miscellaneous exposure protection (boots, gloves, hoods, suits)
- Support equipment
  - Dive flags/floats
  - Repair supplies and tools
  - Scientific sampling equipment (slates, transect tapes, quadrats, etc.)
- Dive Program Vehicle and Dive Trailer

*Funding-* funding for the Scientific Diving Program comes from a variety of sources:

Safety Management (SM)	DOM/DSO salary is entirely supported by SM; SM also provides substantial annual operating funds to cover equipment, professional certification, development, travel costs, and numerous special requests (~\$10,000/year).
School of Marine Sciences (SMS)	Provides funding for academic programming; equipment needs, transportation costs, etc. for both scientific and basic scuba courses (\$5000/yr as of FY2017).
Darling Marine Center (DMC)	Provides funding for facility operations at the DMC including equipment maintenance (compressor, cylinders, FA/O2 kits, etc.) as well as overhead for maintenance and operation of the UMaine Dive Locker (\$5000/yr as of FY2017).
College of Natural Sciences, Forestry, and Agriculture (NSFA)	Provides salary for part-time Scientific Diving Assistant (~\$12,000/year).
Academic Course Fees	Student course fees pay for academic materials and help offset annual equipment maintenance and repair. As of 2017, students pay a combined course and equipment fee of \$700.
Fundraising	A dedicated gift account exists on the UMaine giving website, though it does not see much activity. In 2010, the DSO successfully obtained a \$10,000 foundation grant to purchase scuba equipment for student use. Via our relationship with AAUS, the program has received three private \$5000 gifts to establish and maintain a Scientific Diving Scholarship. Recently, the Development office has expressed interest in providing fundraising assistance.

*Program Assistants-* in addition to the DOM/DSO, in order to effectively supervise instructional diving activities, the program maintains a part-time Scientific Diving Assistant and program Interns. These individuals assist with academic and research related instructional activities and serve as backup for the DOM/DSO. Job descriptions for these positions can be found in Appendices B1 & B2.

## PROGRAM ACTIVITY

### Diving Activity Summary (1995-present)

The UMaine Scientific Diving Program has been active for over 50 years. Accurate data and records are available as far back as 1995. Since 1995 UMaine divers have conducted 20,575 scientific dives and spent a combined total of 13,981 hours underwater. On average, UMaine has 20-30 active scientific divers per year, who conduct an annual average of 935 scientific dives and 635 hours underwater. Graphical summaries of diving activity since 1995 are presented in Figures 1 & 2; gaps represent years for which data are not available.

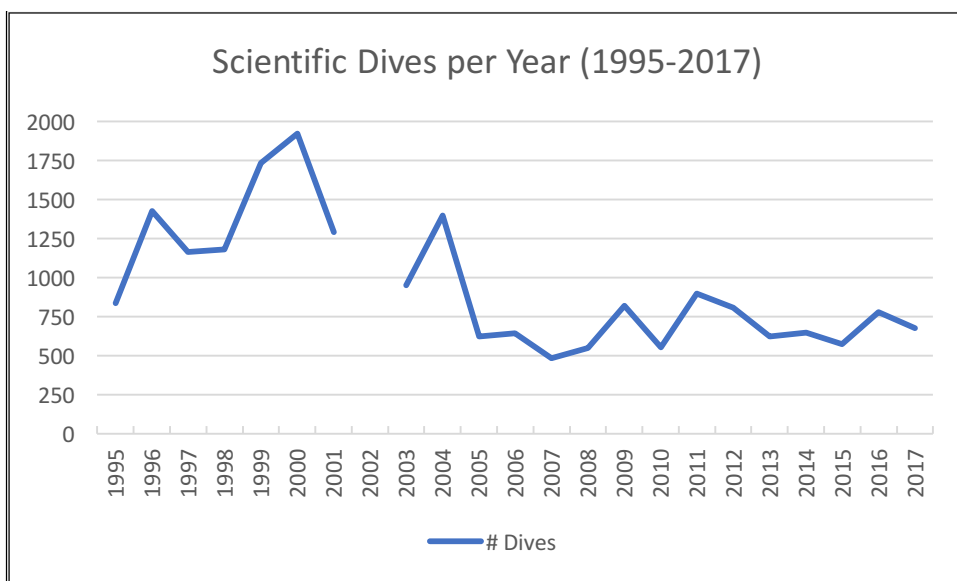


Figure 1- Number of scientific dives per year (1995-2017)

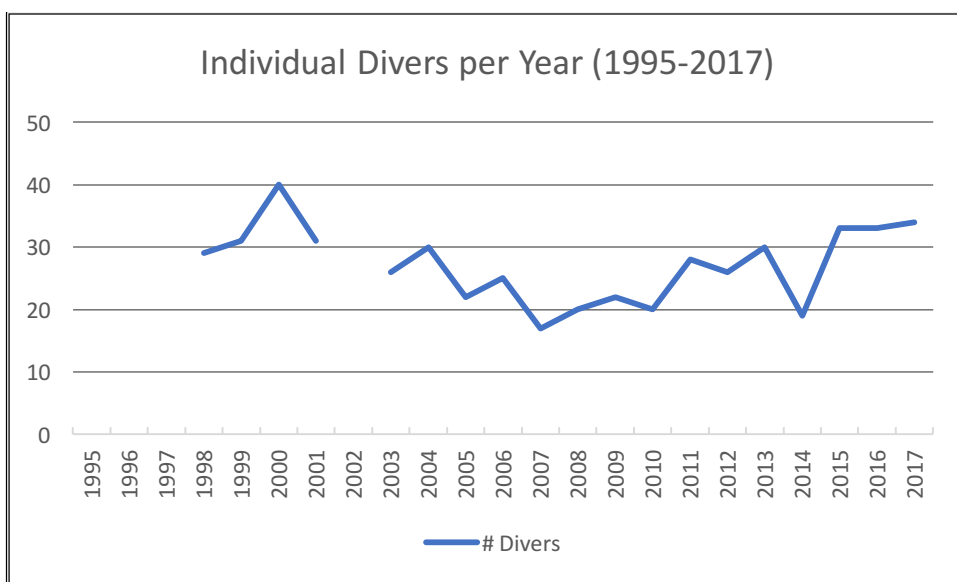


Figure 2- Number of individual scientific divers per year (1995-2017)

### 2017 Diving Activity

UMaine submits a report of diving activity and a self-compliance checklist to AAUS on an annual basis. A copy of the 2017 reports can be found in Appendices C and D. Summaries of 2017 UMaine diving activity by individual diver and by dive team are presented in Tables 2 and 3. In total, 690 scientific and training dives were conducted in 2017, or nearly 2 per day. UMaine's academic diving course (SMS324) accounts for a significant portion (>50%) of this activity.

*Table 2- Number of Dives by Individual Diver  
(2017)*

Adams	37	Liberman	11
Boenish	12	Martin	23
Boss	12	Maxwell	38
Dwyer	4	MMcLaughlin	37
Favitta	23	Oneill	41
Field	17	Ranney	14
Fountain	10	Rashed	18
Fowler	12	Rigaud	68
Gorse	29	Rossin	12
Haentjens	6	Shughnessy	6
Hartill	23	Silver	15
Huntsburger	27	Snyder	15
Jalbert	24	Steneck	23
Johns	25	Stewart	15
Kaupelis	18	Train	22
Kowalsky	11	Wahle	16
Lasdin	15	Wilson	11

*Table 3- Number of Dives by Dive Team  
(2017)*

ASCCW2	25
Boss	4
DSO	40
Haentjens	3
Johns	2
Maxwell	4
Oneill	5
Rich Lab	51
SeaNet	45
SMS324	306
Steneck	135
Wahle	70

### Achievements & Awards

For a relatively small program, UMaine has a number of notable achievements and awards. A summary of these was compiled in January of 2018 for the UMaine Development Office to use in soliciting financial support for the program (Appendix E). A chronological list of notable achievements is presented in Appendix F.

The program highlights the following achievements in 2018:

- Celebrated 10 years of academic diving programs.
- Continued service (C. Rigaud) with AAUS Board of Directors (Supplement 1) and National Park Service (Supplement 2).
- UMaine Sci. Dive Assistants (C. Johns, E. Maxwell, and H. Train) dive with AAUS Board Members at Georgia Aquarium; represent UMaine at NEDSO Meeting and Boston SeaRovers Career Fair.
- UMaine selected as co-host of AAUS/OWUSS Internship (3<sup>rd</sup> year)
- Funds secured for replacement of UMaine dive trailer and DMC air compressor (>\$35,000)
- C. Rigaud invited for USAP DCB Site Visit, McMurdo Station, Antarctica

## CHALLENGES & RECOMMENDATIONS

### Oversight

Restructuring at the UMaine System and subsequent changes to the Dept. of Safety Management have resulted in significantly greater responsibilities for the Diving Operations Manager and Scientific Diving Program; the program is now responsible for diving operations at all UMS campuses and units. This responsibility seemingly also applies to the role of the Diving Control Board, though this body was not involved in or formally informed of these changes. To the knowledge of the DCB and DOM/DSO, there are no active diving operations at any campus units other than UMaine and DMC.

### *Recommendations:*

- DCB Charter- establish a formalized Charter to recognize the role and function of DCB and DSO at the System level. The DCB should be involved in this process.
- DOM Job Description- update the DOM/DSO job description to reflect changes and increased responsibilities; a title change is also suggested.
- Awareness- identify need, establish scientific diving management and oversight at other UMaine System units, and provide resources and support.
- Collaborations/Consortium- establish a state-wide Scientific Diving Consortium to foster collaborations and share resources. See outline/proposal in Appendix G.

### Personnel/ Staffing

Implementation and management of an effective scientific diving program requires a greater level of oversight and management than most occupational safety programs or standing safety policies. The program will require continued staffing support to meet current and future demands.

### *Recommendations:*

- Scientific Diving Assistants- formalize and increase commitment for Sci. Diving Asst. position; provide financial support for Divemaster Internships.
- Continuing Education- train current Sci. Diving Asst. as a Scuba Instructor; train DOM/DSO as an Instructor-Trainer. Ensure continued engagement with AAUS and broader scientific diving community.
- Unit Diving Officers- hire Unit Diving Officers and Assistants at other campuses as necessary.

### Administration/Logistics

The scientific diving program operates more like a University department, with a need for financial and resource infrastructure and support.

### *Recommendations:*

- Continue Safety Management operational allocation for DOM/DSO position (~\$10,000)
- Provide UM System budget match to DMC/SMS program allocation (>\$5,000)
- Work with IT to establish system-wide diver recordkeeping system

### Programmatic

The current level of programming is adequate, but may require growth to meet future needs.

### *Recommendations:*

- Provide additional training opportunities (as staffing allows)
  - Additional Basic Scuba course
  - New UW Research Methods Course
- Establish procedures for 'non-exempt' scientific dives/ working dives.

## **APPENDIX A- Diving Operations Manager Job Description**

Department of Safety & Environmental Management  
The University of Maine

**Title:** Diving Operations Manager

**Date:** November 3, 2012

**Department:** Safety & Environmental Management (SEM)

**Reports to:** Director, Safety & Environmental Management

**Purpose:** The Diving Operations Manager (DOM) exists to provide guidance, support, technical expertise, and oversight to scientists and students who wish to utilize scuba diving in the pursuit of research and educational goals. The purpose of the DOM is to facilitate underwater research and education while ensuring that diving operations are conducted in a safe and efficient manner and in compliance with applicable regulations and national standards. The DOM is responsible for supervising all programmatic aspects of University sanctioned diving activities at UMaine and all affiliated remote sites; The DOM may also be called upon to instruct or participate in diving activities sponsored by academic departments (i.e. School of Marine Sciences). This employee is based at the Darling Marine Center (DMC) where he/she also manages hazardous waste operations and performs other SEM related functions as described/assigned.

### **Essential Duties and Responsibilities:**

Diving Operations - Manage all programmatic aspects of UMaine diving programs in accordance with applicable regulations and community standards. Supervise and support scientific diving conducted under UMaine auspices; manage, administer, and participate in campus-wide scientific diver training and certification. Design and implement diver training programs in conjunction with the mission and objectives of UMaine academic departments; act as an instructor in credit bearing diver training courses and assist with the management and administration of all scuba courses offered through the University including recruitment, training, and supervision of scuba instructional staff. Participate in a variety of scientific diving research projects as a diver, diving safety supervisor, and/or a researcher; assist in the planning and execution of scientific diving and related research projects; provide expertise and technical support. Manage University owned/operated diving facilities and equipment; organize and implement a diving equipment and maintenance program. Administer diving program budgets, grants, and charitable giving account. Supervise program assistants as necessary. Liaison with Diving Control Board (DCB) and scientific diving community (American Academy of Underwater Sciences, AAUS); provide updates and reports as required. As required/named by the AAUS, the DOM serves as the "Diving Safety Officer" for UMaine.

Academic Diving - The DOM is responsible for a number of diving-related teaching activities, including the development of academic programming, support of marketing and outreach activities, and developing funding requests or grant proposals for the purchase of diving equipment. The teaching commitment of the dive operations manager is limited to one scientific diving course (one section only) per semester and one a basic dive safety course (one section only) per semester.

Hazardous Waste - Darling Marine Center- Manage all aspects of hazardous waste generation at DMC in accordance with applicable regulations and University policy. Prepare, maintain, and implement required regulatory plans, documents, and forms as required by law. Perform Hazardous Waste collections, determinations, and maintain Hazardous Waste storage site. Conduct Hazardous Waste training for DMC employees. Supervise hazardous waste assistants as necessary.

Facility Emergency Coordinator (FEC); Darling Marine Center- Serve as secondary FEC at DMC; assist DMC Facility Managers with planning, preparation, and response to emergencies. Provide support with preparation and implementation of facility emergency response plans/documents; participate in FEC/Safety Committee meetings/discussions. Respond to emergencies, coordinate resources, and liaison with emergency personnel as necessary.

SEM Specialist - Perform other SEM functions as assigned, including but not limited to:

- Conduct specialized safety training as necessary
- Perform safety audits and accident investigations as needed
- Act as a liaison for DMC personnel on SEM matters in cooperation with other SEM staff
- Monitor compliance with the UMaine Watercraft Operations

**Qualifications:**

**Education/ Certifications**

- A Bachelor's degree or equivalent with a background in the sciences is preferred.
- Current certification as a scuba instructor with an internationally recognized training agency; current certification as an emergency response instructor (CPR/AED, First Aid, Oxygen Administration).
- Must pass scientific diver physical exam and a driver's license background check.

**Knowledge/Skills**

- Knowledge of regulatory and community scientific diving procedures, practices and standards.
- Knowledge of underwater scientific diving methods and techniques necessary to accomplish research or other mission objectives.
- Knowledge of diving technology, instrumentation, and equipment; familiarity with scientific technology, instrumentation, equipment, and procedure associated with scientific diving operations.
- Ability and skill necessary to perform a variety of underwater tasks under adverse/difficult conditions.
- Ability to serve as working diver, lead diver, dive supervisor, and/or mission coordinator during research diving operations involving a variety of diving technologies.
- Ability to perform demonstration quality skills for training/instructional purposes.
- Ability to manage compliance with institutional diving policy.
- Knowledge of chemistry or related sciences is preferred; work experience may be substituted for education.
- Experience with OSHA, EPA/DEP, USCG regulations, chemical safety and hazardous waste regulations, and national incident management system (NIMS) is preferred; training in these areas can be provided.
- Experience and knowledge with marine/ boating safety is required.

**Communication Skills**

- The employee must have excellent written and oral communication skills.
- Ability to read, interpret, and write technical/regulatory instructions, manuals, and official reports.
- Ability to communicate with scientists, students, staff, administrators, technicians, industry specialists, regulatory officials, and the general public.

**Managerial Skills**

- Ability to provide oversight of technical and administrative programs and activities.
- Ability to coordinate and manage facilities, equipment, supplies, and related resources; understands and complies with safety measures to maintain a safe working environment.

**Position Type: Professional**

**Supervisory Responsibilities:** Supervises diving program assistants/instructors and hazardous waste assistants as required.

**Work Schedule:** Full-time regular fiscal year position; regular University of Maine work schedule. In consultation with the supervisor the employee is expected to establish regular office hours; work beyond regular hours (to include nights and weekends) may be necessary. Additionally, the employee is expected to be on call to coordinate resources and conduct required reporting in response to emergencies at the Darling Marine Center and at other UMaine facilities.

**Schedule for Evaluations:** In accordance with UMPSA agreement/contract.

**Salary Grade:** 5

## APPENDIX B1- Program Assistant Job Description (Professional)

**Position Title:** Scientific Diving Assistant, Professional

**Department:** School of Marine Sciences

**Supervisor:** UMaine Diving Operations Manager

**Description:** ***Part-time, temporary position.*** Primary responsibility of the position is to assist the Diving Operations Manager with the instruction and supervision of students enrolled in SMS academic diving courses (SMS324- *Introduction to Research Diving, Basic Scuba*). This position is based primarily at the Darling Marine Center in Walpole and is field intensive.

**Location:** Darling Marine Center, 193 Clark's Cove Road, Walpole, ME 04573 (Summer/Fall)  
Wallace Pool, University of Maine, Orono, ME 04469 (Spring)

**Period/Time:** 12-16 hrs./week for 6-12 months; Spring, Summer and/or Fall terms. Exact schedule to be determined

**Qualifications:** Candidates must demonstrate diving/ watermanship ability acceptable to the instructor, as well as knowledge of scientific diving regulations, skills, and techniques. Ability to follow strict safety guidelines and detailed work instructions but also take appropriate initiative and operate independently. Desire and motivation to exhibit role-model behavior and serve as a mentor to student divers. Duties include but may not be limited to: preparing equipment, filling scuba cylinders, grading/reviewing student assignments, preparing/ presenting course lectures, and instructing/ supervising divers during both confined and open water dive activities.

### Requirements:

- Status as an active and insured Divemaster or Instructor (PADI or SDI preferred)
- Current AAUS/UMaine Diving Medical Exam
- Current certification in CPR/FA/O2 administration (Instructor rating preferred)
- Previous training/qualification as an AAUS Scientific Diver preferred (equivalent experience acceptable)
- Ability to drive a University vehicle
- Must provide all personal diving equipment

### Compensation:

Financial: Commensurate with experience.

In-kind: Costs of course-related boat dive, CPR/FA/O2 re-certification, some meals provided on dive-days.

**Benefits:** University health and other benefits do not apply.

**To Apply:** Applicants should submit a letter of intent, professional resume/vitae, and a record of diving activity (Dive Log) to the UMaine Diving Safety Officer. Applications will be reviewed and potential candidates will be chosen; phone or personal interviews will be scheduled as necessary.

**Application Deadline:** Applications are accepted on an ongoing basis with the following deadlines:

- Jan 15- Spring session
- Apr 15- Summer session
- Jul 15- Fall session

### Additional Expectations and Responsibilities:

#### *General Characteristics*

- High-quality personal diving skills
- Positive and professional attitude
- General understanding of Dive Leader role
- Motivated independent worker
- Interest and ability to serve as a mentor to student divers
- Role model behavior in the classroom and the field

#### *Academic/Field Duties*

- Arrive on-site as scheduled, on-time and prepared
- Assist with student concerns, issues, and problems
- Encourage teamwork and positive attitude among student divers
- Review/grade student assignments; maintain student assignment completion roster
- Assist with preparation and maintenance of University vehicles and dive trailer
- Guide students in preparation, packaging, and transport of necessary field equipment
- Assist with dive site preparation and management

## APPENDIX B2- Program Assistant Job Description (Internship)

**Position Title:** Scientific Diving Assistant, Internship  
**Department:** School of Marine Sciences  
**Supervisor:** UMaine Diving Operations Manager

**Description:** ***Part-time, temporary position.*** The primary responsibility of the intern is to serve as a Dive Leader and assist with the instruction and supervision of students enrolled in SMS academic diving courses. The position is based primarily at the Darling Marine Center and is field intensive. The internship provides the necessary training and experience to earn certification as a Divemaster.

**Location:** Darling Marine Center, 193 Clark's Cove Road, Walpole, ME 04573 (Summer/Fall)  
Wallace Pool, University of Maine, Orono, ME 04469 (Spring)

**Period/Time:** 12-16 hrs./week for 6-12 months; Spring, Summer and/or Fall terms. Exact schedule to be determined

**Qualifications:** Candidates must demonstrate diving/ watermanship ability acceptable to the instructor, as well as knowledge of scientific diving regulations, skills, and techniques. Ability to follow strict safety guidelines and detailed work instructions but also take appropriate initiative and operate independently. Desire and motivation to exhibit role-model behavior and serve as a mentor to student divers. Duties include but may not be limited to: preparing equipment, filling scuba cylinders, grading/reviewing student assignments, preparing/ presenting course lectures, acting as a certified dive buddy, and supervising divers during both confined and open water dive activities.

### Requirements:

- Current status as a UMaine Scientific Diver; previous training as an AAUS Scientific Diver or equivalent experience acceptable. Experience with SMS324 preferred.
- Current AAUS/UMaine Diving Medical Exam and other administrative requirements
- Medical insurance specific to scuba diving
- Current certification in CPR/FA/O2 administration
- Ability to drive a University vehicle
- Must provide all personal diving equipment (\*some equipment may be available from UMaine)

### Compensation:

- **Financial:** None; this is an unpaid internship position.
- **In-Kind:** Divemaster academic materials and training (value: ~\$600), CPR/FA/O2 re-certification (value: ~\$100), course-related boat dive (value: ~\$150), some meals provided on dive days.

**NOTE:** While academic materials and training are provided as a portion of the internship, the Divemaster application fee must be paid by the intern (~\$100-150).

**Benefits:** None, University health and other benefits do not apply.

**To Apply:** Applicants should submit a letter of intent, professional resume/vitae, and a record of diving activity (Dive Log) to the UMaine Diving Safety Officer. Applications will be reviewed and potential candidates will be chosen; phone or personal interviews will be scheduled as necessary. Applications are accepted on an ongoing basis with the following deadlines:

- Jan 15- Spring session
- Apr 15- Summer session
- Jul 15- Fall session

### Expectations and Responsibilities

In addition to the responsibilities outlined in the *Scientific Diver Statement of Understanding and Code of Conduct*, as a scientific diving intern, divemaster candidate, and a future industry professional, you are expected to exhibit the personal and professional characteristics listed below. You will follow the guidance of your supervisor in certain situations, but you must also be self-motivated and learn to assist the instructor by anticipating what needs to be done instead of waiting for instructions.

### *General Characteristics*

- High-quality personal diving skills
- Positive and professional attitude
- General understanding of Dive Leader role
- Motivated independent worker
- Interest and ability to serve as a mentor to student divers
- Role model behavior in the classroom and the field

### *Academic/Field Duties*

- Complete academic and practical exercises as directed in professional Divemaster manual.
- Arrive on-site as scheduled, on-time and prepared
- Assist with student concerns, issues, and problems
- Encourage teamwork and positive attitude among student divers
- Review/grade student assignments; maintain student assignment completion roster
- Assist with preparation and maintenance of University vehicles and dive trailer
- Guide students in preparation, packaging, and transport of necessary field equipment
- Assist with dive site preparation and management

### *Divemaster Certification*

The intern will be provided the necessary training and experience to earn certification as a scuba-industry Divemaster. To do so, the intern must complete all required academic coursework and practical exercises in order to gain experience with a variety of diving activities. At minimum, interns must participate in one entire basic scuba course, one entire scientific diving course, and one discover scuba course.

Certification as a Divemaster is considered the first step towards becoming a diving-industry professional. As such, responsibility for completing the academic and participatory requirements of the internship rests solely with the candidate; professional level behavior and work is expected during all aspects of the program. The structure of diving courses at UMaine provides ample opportunities to complete these objectives over the course of a single year. Unless other arrangements are made, the internship will be officially terminated one year from the start date, regardless of whether the intern has met the requirements for Divemaster certification.

## APPENDIX C- AAUS Self-Evaluation Checklist

The AAUS requests that its Organizational Members use this provided compliance checklist to self-evaluate their programs, and maintain this record along with an up to date Dive Safety Manual uploaded to the AAUS web portal.

**AAUS OM**  
**Program Self-**  
**Evaluation**  
**C. Rigaud, UMaine; self-evaluation (Jan. 2018)**

### Inspection

	YES	NO	N.A.	Question
<b>A</b>	<b>Administration: definitions per OSHA 29CFR1910 or AAUS standards</b>			
.				
1	✓			Is the DCB's membership composed of a <b>majority active</b> scientific divers?
2	✓			Does the DCB have <b>autonomous and absolute authority</b> over the scientific diving program's <b>operations</b> ?
3	✓			Is the DSO an <b>active</b> scientific diver?
4	✓			Is the DSO an <b>current, renewed instructor</b> from an internationally recognized underwater instruction agency?
5	✓			Is the DSO a <b>full member</b> of AAUS?
6	✓			Are all data and information obtained during the project considered <b>non-proprietary</b> ?
7	✓			Are divers either <b>scientists or scientists in training</b> ?
8	✓			Do scientific divers function as <b>observers</b> and <b>data gatherers</b> ?
9	✓			Review any incident reports and system for documenting
<b>B</b>	<b>Diving Safety Manual (DSM)</b>			
.				
1	✓			Is DSM approved (latest revision/review) by DCB and AAUS and cover all OM's scientific diving operations?
2	✓			Includes diver training and certification requirements?
3	✓			Includes medical review standards and required physical examinations criteria?
4	✓			Includes procedures for emergency care, recompression and evacuation
5	✓			Are required records (certification, medical, dive log, injury, equipment) kept for the minimum intervals?
6	✓			Is a mechanism in place to collect individual dive log data for AAUS reporting?
7	✓			Were previous year diving statistics reported to AAUS on time?
<b>C</b>	<b>Training</b>			
.				
1	✓			Is a diver training program of 100 hours with at least 12 training dives for DITs for scientific diver certification conducted?

- 2 ✓ If no diver training course is part of OM's program, is other training documentation in place?
- 3 ✓ Review documentation of Instructional Training staff and Lead Diver Qualifications
- 4 ✓ Are all scientific divers currently certified in diving first aid (Oxygen administration, CPR and First Aid)?
- 5 ✓ Have all scientific divers received Hazmat training for transportation of compressed gas cylinders every 3 years as per OSHA?

#### **D Field Operations**

- 1 ✓ Is a diving accident management plan (with diver emergency contact information) prepared for each operational diving area?
- 2 ✓ Is a Lead Diver designated for each dive operation?
- 3 ✓ Review of dive project proposals, including depth authorizations of project divers
- 4 ✓ Are reciprocity letters reviewed for all visiting scientific divers?
- 5 ✓ Are at least two comparably equipped scientific divers in constant communication underwater on every dive?

#### **E Scuba diving equipment**

- 1 ✓ Is all program diving and safety equipment maintained and documented in accordance to manufacturers recommendations?
- 2 ✓ Review documentation of OM's science divers annual equipment inspections
- 3 ✓ Is all diving equipment that is in need of repair or maintenance tagged and separated from operational gear?

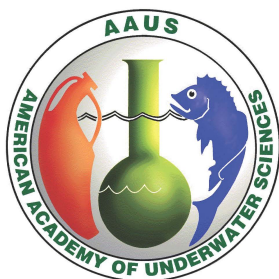
#### **F Air compressor systems**

- 1 ✓ Are the operational procedures posted for the air system and compressor?
- 2 ✓ Has an air sample from the system been taken in the last 6 months and tested against CGA Grade E?
- 3 ✓ Is there a logbook documenting the operational and maintenance history of the compressor and the air system?
- 4 ✓ Is the air intake located and clearly labeled in an area that is free of potential contaminants to the air supply?

#### **G Safety equipment**

- 1 ✓ Are a first aid kit and emergency oxygen available?

## APPENDIX D- AAUS Statistics Report (UMaine, 2017)



### Welcome University of Maine Stats Summary Report for 2017

Year: 2017

The Total number of Divers Logging Dives during this reporting cycle is: 34

The Total number of Dives Logged during this reporting cycle is: 674

The Total Dive Time Logged during this reporting cycle is: 24545

#### Dives by Purpose

	Dive Time In Minutes	Dives Logged	Number of Divers Logging Dives
Scientific	8761	297	22
Training and Proficiency	15784	377	34

#### Dives by Diving Mode

	Dive Time In Minutes	Dives Logged	Number of Divers Logging Dives
Open Circuit Scuba	24545	674	34
Hookah	0	0	0
Surface Supplied	0	0	0
Rebreathers	0	0	0

#### Dives by Breathing Gas

	Dive Time In Minutes	Dives Logged	Number of Divers Logging Dives
Air	24040	663	34
Nitrox	505	11	4
Mixed Gas	0	0	0

#### Dives by Decompression Profiling Method

	Dive Time In Minutes	Dives Logged	Number of Divers Logging Dives
Dive Tables	13224	295	30
Dive Computers	11321	379	34
Dive Software	0	0	0

#### Dives by Specialized Diving Environment

	Dive Time In Minutes	Dives Logged	Number of Divers Logging Dives
Required Decompression	210	6	1
Overhead Environment	0	0	0
Blue Water	0	0	0
Ice / Polar	0	0	0

Saturation Diving	0	0	0
Aquarium Diving	0	0	0

---

**Scientific or Training/Proficiency Dives by AAUS Depth Range**

Depth Range	Dives Logged	Number of Divers Logging Dives
0 - 30 feet	431	34
31 - 60 feet	200	29
61 - 100 feet	36	20
101 - 130 feet	6	2
131 - 150 feet	1	1
151 - 190 feet	0	0
191 - > feet	0	0

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**Diving Incidents This Reporting Cycle: 0**

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## **APPENDIX E- UMaine 'Diving by the Numbers' (as presented, Jan. 2018)**

### **History and Reputation**

- 50+ years of scientific diving activity (1960s-present)
- 20+ years as AAUS members (1995-present)
- First AAUS institution in Maine
  - 1 of only ~150 worldwide
  - 1 of only 3 in Maine
  - 1 of only 12 in New England

### **UMaine Diving Activity (1995-present)** (\*excluding 2002, no data)

- 20,575 scientific dives conducted
- 13,981 hours spent underwater
- 935 scientific dives/year
- 635 hours underwater/year
- 20-30 individual divers/year

### **Leadership and Awards**

- 12 years representation, AAUS Board of Directors (2006-present)
- 5 years representation, NSF US Antarctic Program DCB (2013-present)
- 5 National Scholarship winners (AAUS)
- 4 National Interns (AAUS-OWUSS)
- 3 years representation, National Park Service Dive Leadership Staff
- 2 years representation, ACE educational review panel

### **Academic Programming**

- 10 years of Academic Scientific Diving courses (2008-present)
- 279 credit hours (~28/year)
- 99 Scientific Diving students (~10/year)
- 42 Basic Diving students (~7/year)

### **Finances**

#### *Revenue/expenses*

- xx research dollars.... [currently trying to cobble this together from various PIs]
- \$79,794 tuition dollars generated (based on in-state tuition @ \$858/3cr)
- \$58,000 annual salary, Diving Operations Manager (UMaine System, SEM)
- \$31,000 annual operating budget
  - \$10,000 DSO specific support (SEM)
  - \$11,000 annual salary, Sci. Diving Asst. (NSFA)
  - \$10,000 equipment and supplies (SMS/DMC)
- \$750 course fee (sci. diving); \$400 course fee (basic scuba)

#### *Gifts*

- \$15,000 in gifts to support Sci. Diving scholarships (private donor)
- \$10,000 grant to purchase equipment for Sci. Diving students (foundation)

#### *Needs*

- \$45,000 for air station/ compressor replacement
- \$15,000 for scuba equipment replacement

## APPENDIX F- Timeline of Notable Achievements (2003-2018)

<b>2006</b>	<ul style="list-style-type: none"> <li>• C. Rigaud appointed to AAUS Board of Directors</li> </ul>
<b>2007</b>	<ul style="list-style-type: none"> <li>• AAUS Kathy Johnston PhD Scholarship (S. Arnold)</li> </ul>
<b>2008</b>	<ul style="list-style-type: none"> <li>• Inaugural Academic Scientific Diving course</li> </ul>
<b>2010</b>	<ul style="list-style-type: none"> <li>• \$10,000 grant to purchase scuba equipment (Dorr Foundation)</li> <li>• UMaine equipment inventory = 10 full sets of scuba gear</li> </ul>
<b>2011</b>	<ul style="list-style-type: none"> <li>• UMaine hosts 30<sup>th</sup> Annual AAUS Symposium</li> <li>• Dearborn Sci. Diving Scholarship established (\$5000 private donation)</li> </ul>
<b>2012</b>	<ul style="list-style-type: none"> <li>• Inaugural SMS Basic Scuba course</li> <li>• Financial support for Sci. Diving Assistant established (SMS)</li> </ul>
<b>2013</b>	<ul style="list-style-type: none"> <li>• Internal allocation for Dive Trailer (SMS, Fei Chai)</li> <li>• C. Rigaud appointed to NSF USAP DCB</li> <li>• Dearborn Sci. Diving Scholarship renewed (\$5000 private donation)</li> </ul>
<b>2014</b>	<ul style="list-style-type: none"> <li>• C. Rigaud appointed as National Park Service (NPS) Guest Instructor</li> <li>• Hosted AAUS/OWUSS Intern (K. Newcomer)</li> <li>• AAUS Kathy Johnston PhD Scholarship (M. McMahan)</li> </ul>
<b>2015</b>	<ul style="list-style-type: none"> <li>• C. Rigaud appointed as AAUS Treasurer</li> <li>• C. Rigaud, ACE National Review committee</li> <li>• Hosted AAUS/OWUSS Intern (C. Mitchell)</li> <li>• AAUS Kathy Johnston PhD Scholarship (A. Harrington)</li> <li>• AAUS Travel Award (M. McMahan)</li> </ul>
<b>2016</b>	<ul style="list-style-type: none"> <li>• C. Rigaud NPS Guest Instructor</li> <li>• NSFA Sci. Diving account established</li> <li>• \$11,000 salary commitment to permanent P/T Sci. Dive Asst. (NSFA-SMS)</li> <li>• SEM provides dedicated Sci. Diving vehicle</li> </ul>
<b>2017</b>	<ul style="list-style-type: none"> <li>• C. Rigaud, ACE National Review committee</li> <li>• OWUSS Bonnier Publishing Intern (C. Brunton)</li> <li>• Dive Truck upgrade (Chevy Avalanche, SEM funded)</li> <li>• 10<sup>th</sup> consecutive semester of SMS324</li> <li>• AAUS Travel Award (E. Maxwell)</li> <li>• Dearborn Scientific Diving Scholarship renewed (\$5000)</li> </ul>
<b>2018</b>	<ul style="list-style-type: none"> <li>• C. Rigaud NPS Guest Instructor</li> <li>• Co-Host AAUS/OWUSS Intern (S. Farrell)</li> <li>• Dive Trailer upgrade (\$3500, FY17 Sci. Dive Program funds)</li> <li>• \$30,000 internal allocation, DMC air compressor replacement (Provost/DMC)</li> <li>• C. Rigaud, NSF USAP DCB site visit, McMurdo Station Antarctica</li> </ul>

## APPENDIX G- Maine Scientific Diving Consortium

### Maine Scientific Diving Consortium Proposal (2017)

#### *Objective:*

Establish a UMaine initiated scientific diving consortium among Maine-based research institutions, universities and other entities.

#### *Justification:*

- UMaine is the largest and longest established scientific diving program in Maine, and currently 1 of only 3 AAUS Scientific Diving Programs in the state (MMA, Bigelow).
- UMaine possesses the expertise, facilities, and resources to manage and supervise scientific diving oversight and training.
- The UMaine scientific diving program is consistently solicited to provide these services but currently lacks the mechanism to do so.

#### *Benefits for UMaine:*

- Provide much needed external funding for the UMaine scientific diving program.
- Solidify the reputation of UMaine-DMC, as THE principal marine lab and scientific diving institution in the state of Maine.
- Increase awareness and use of UMaine research facilities.

#### *Benefits for participating entities:*

- Facilitate compliance with scientific diving policy and regulations.
- Reduce financial burden of hosting independent scientific diving programs.
- Centralize the administration and training aspects of scientific diving institutions.
- Promote collaboration and cooperation among diving scientists.

#### *Function:*

- UMaine will create and manage a centralized, state-wide scientific diving program using a model similar to other scientific diving consortiums. Membership to include: any/all UMaine System campuses, GMRI, Colby/Bates/Bowdoin Colleges, Bigelow Laboratory, U. New England, Hurricane Island Foundation, Manomet Research Lab, Island Institute).
- A single Diving Control Board (DCB) will supervise all diving activities; participating entities would be encouraged to have representation on the DCB.
- A single Director of Diving Programs / Diving Safety Officer (DDP/DSO) will serve as the chief administrative officer and manage/oversee a centralized clearinghouse for scientific diver records, training, and certification
- Satellite/unit DSOs will be utilized at other facilities/locations as necessary.
- All participating institutions will accept and acknowledge legal responsibility for their own employees, students, and other affiliated divers.
- All participating institutions will pay a flat annual overhead fee, and a per diver fee to participate in the program (to be determined).

#### *Professional Positions:*

##### 1. Director of Diving Programs (DDP):

- Based at UMaine Darling Marine Center (DMC).
- Directs and oversees all participating programs within the consortium.
- Oversees Unit Diving Operations Managers/ Diving Safety Officers based at other locations within the consortium.
- Permanent F/T position at Director-level salary (C. Rigaud)

2. Diving Operations Managers (DOM):

- Diving instructors/examiners in residence at campuses with large programs.
- Teach scientific and basic scuba programs, perform checkout dives, etc.
- Same position C. Rigaud holds now. FT@ > \$40K/annual.

3. Diving Safety Officer (DSO):

- Administrative only position at regional/satellite campuses with scientific divers, but no instructional programs.
- Review dive plans, record dive logs, handle equipment maintenance logs, etc.
- PT @ \$20K/annual.

*Other Potential Benefits/ Requirements:*

- Increase UMaine scuba equipment inventory to 20 full-sets.
- Continue to provide 2 full scientific diving courses
  - SMS324- *Introduction to Research Diving* (Fall, Summer)
- Increase Basic Scuba to 2 courses
  - Spring-term (Orono), Summer intensive?
- Create/introduce spring-break Sci. diver course/research experience
- Annual budget/ spending account



*The University of Mississippi*

Oxford • Jackson • Tupelo • Southaven

Department of BioMolecular Sciences  
Post Office Box 1848  
University, MS 38677-1848  
U.S.A.

4 February 2018

Chris Rigaud  
Diving Safety Officer  
University of Maine

Greetings Chris

I want to thank you for your continued service and leadership in the scientific diving community; specifically, as it relates to the American Academy of Underwater Sciences (AAUS). Our continued role as the preeminent voice in the facilitation and safety of diving scientists worldwide could not occur without the selfless support and counsel of individuals like yourself. I have always appreciated your insights, and institutional memory, as they relate to the myriad issues we address in furthering the Academy's goals. I am also confident in the fiscal success of AAUS with you in the crucial position of Treasurer.

I know that leadership service to AAUS demands considerable time, both professionally and personally, and I sincerely appreciate your willingness to take on the extra workload. Please let your administration know that the AAUS is grateful for their in-kind support of your time. If they require any additional information regarding your critical role to AAUS please do not hesitate to have them contact me ([slattery@olemiss.edu](mailto:slattery@olemiss.edu)).

Thanx & aloha,

Marc Slattery, Ph.D.  
Professor of BioMolecular Sciences,  
University of Mississippi Diving Safety Officer, and  
President of AAUS

## SUPPLEMENT 2- NPS Dive Leader Service Letter



United States Department of the Interior  
NATIONAL PARK SERVICE  
National Dive Control Board  
Steve Sellers – Diving Safety Officer

12795 West Alameda Parkway  
Denver, Colorado 80225  
(303)969-2901  
steven\_sellers@nps.gov



February 22, 2018

### Memorandum

To: Michael Sauda and Dr. William Ellis, The University of Maine  
Cc: Chris Rigaud, DSO, The University of Maine  
From: Steve Sellers, Dive Safety Officer, WASO  
Subject: Access to Chris Rigaud for NPS Dive Leadership, February 5-16, 2018

Thank you for allowing Chris Rigaud to staff the 2018 NPS Dive Leadership Training Course held on Catalina Island, CA, February 5<sup>th</sup>-16<sup>th</sup>. Chris was integral to this training and is one of the major reasons we were able to put on such a successful program. This training rotation included eight candidates from across the National Park Service (NPS), with vastly different experience and skill levels. He was one of the highest rated instructors on our staff by the candidates on the course evaluations. I echo that sentiment. He was tireless in his efforts to make this training valuable and successful, and he was extremely professional in his dealings with students, staff, and our hosts in Catalina. I consider him a wonderful resource for the NPS Dive Program and a fantastic representative for the University of Maine, and the Darling Marine Center. He is definitely on the short list for staffing future NPS diving training efforts and it is hoped he will continue to have your support for his participation.

**STEVEN SELLERS**

Digitally signed by STEVEN SELLERS  
Date: 2018.02.22 11:11:58 -07'00'