THE UNIVERSITY OF MAINE

ORGANIZATIONAL MEMBER OF
THE AMERICAN ACADEMY OF UNDERWATER SCIENCES

STANDARDS FOR SCIENTIFIC DIVING

**** SPECIAL ADDENDUM ***

COVID-19 Diving Procedures

Effective period: 1 March- 31 December 2021

UMaine Scientific Diving Program
COVID-19 Diving Procedures

Overview

Considering the continued impacts of the COVID-19 Pandemic upon University activities, the UMaine Diving Control Board is providing the following guidance and requirements for scientific diving operations. The guidelines set forth in this protocol have been adapted from various procedures within the national and international scientific diving communities, including the American Academy of Underwater Sciences (AAUS), Divers Alert Network (DAN), Undersea and Hyperbaric Medical Society (UHMS), National Park Service (NPS), University of California System, (UC), University of Hawaii (UH), and others. Much of this information is available online, but specific elements are not cited in this document. Additionally, in accordance with UMaine return to work procedures, a Hierarchy of Controls (HoC) worksheet is included in Appendix 1.

This guidance is considered current best practice. The situation continues to evolve and as such, changes to these practices may be required as new information becomes available. These guidelines do not replace or supersede Federal, State, or Local governmental policy or those of the University System or UMaine Facility administrators and safety coordinators; all such policies must be adhered to in addition to these guidelines.

Diving activities generally involve a high degree of personal contact in highly variable conditions. There is currently no peer-reviewed literature available demonstrating the potential risk of transmission when returning to diving operations, or the potential impact on individual diver health after contracting COVID-19. As such, while the following requirements are designed to help minimize disease transmission and lessen risk, they cannot be guaranteed to be 100% safe or effective; however, the scientific diving community is in agreement that diving operations can be conducted safely, when adhering to general protocols for minimization of group sizes, social distancing, face coverings, and general hygiene.

Return to Campus Procedures

All UMaine scientific divers must follow all
University and campus/facility-specific protocols for phased reopening and return to work. It is the responsibility of the PI and Lead Diver to ensure compliance with all University and site-specific protocols for returning to work. See DMC Protocol for 'Return to Campus' and 'Conducting Essential Research'; www.dmc.maine.edu (Appendix 2).

+++ Diving Operations +++
(Administrative)

Dive Plans
All Dive Plans approved or submitted prior to the posting of this addendum must be resubmitted for review and approval. The process for approving diving operations during COVID-19 will be as described below.

- ✓ **Step 1**- Approval from University OVPR for 'essential research' activity
- ✓ **Step 2**- Approval for 'return to campus' by campus administrators and safety coordinators
- ✓ **Step 3**- Dive Plan submitted to DCB and DSO; referencing approval of Steps 1&2
- ✓ **Step 4**- Dive plan incorporates/references dive-specific protocols for operations during COVID-19.

Diver Training and Qualification
All UMaine and AAUS standards for the training and qualification of scientific divers remain in effect. Pursuant to approval of the Dive Plan, current and active scientific divers may engage in diving activities for which they were previously qualified. Until the restriction on in-person training is lifted, divers new to the UMaine program will not be able to be trained or qualified.

All UMaine divers are required to complete *Emergency First Response (EFR)* "Airborne Pathogens Training". Please submit certificates of completion when submitting Dive Plans.
https://www.firstresponse-ed.com/stay-safe/

Reciprocity
Divers previously trained and authorized as Scientific Divers according to AAUS minimum standards will be authorized by UMaine if they can produce a Verification of Training/Reciprocity Letter with all elements complete, up to date, and verified. UMaine divers planning to travel to other institutions on Reciprocity should make arrangements well in advance to ensure operations are currently active. Be aware that receiving institutions may have more restrictive policies/procedures. Compliance with UMaine travel-policy is the responsibility of the PI.

Diver Medicals and Emergency Care Training
Divers whose periodic Diving Medical Exam and/or Emergency Care Training (CPR/FA, etc.) expired in 2020 were provided a grace-period to renew these elements through Dec. 31, 2020; this provision is not extended into 2021.

This exemption does not apply to any diver who has tested positive, or been presumed positive, diagnosed, or become ill with COVID-19. Any diver who has tested positive, or been presumed positive, diagnosed, or become ill with COVID-19 must undergo a full diver medical clearance prior to resuming diving and submit the newly approved medical exam documentation to the DSO.

As of 1 March 2021, all UMaine divers must also complete a COVID-19 Medical Assessment for Divers in addition to any/all required medical exams (Appendix 4).

+++ Diving Operations +++
(Operational)

General

- Follow all University policies for 'Return to Work', 'Essential Research', Minimization of Group Size, Social Distancing, Personal Hygiene, and use of Face-coverings /PPE.
- Limit the number of people in the dive locker, equipment room, drying and/or wash-down area at the same time; consider preparing and cleaning dive gear on a rotating schedule.
- Frequent and proper handwashing is encouraged throughout all phases of diving operations. *[If facilities are not available, portable hand sanitizer may be used. Alcohol-based sanitizers are discouraged due to fire/ignition risk; if alcohol sanitizers are the only option, all surfaces must be completely dry prior to handling dive equipment.]*

Equipment

- Each diver must use gear dedicated for their use only. Individual gear should be isolated as much as practicable during set-up, transport, break-down, and storage.
- Each diver will assemble and disassemble only their own equipment.
- All divers must have an 'octopus' as their secondary air source to share. Equipment configured with an 'Air2' must be modified to include an 'octopus'.
- All handheld equipment and field gear (when possible) should be cleaned/disinfected after use. See detailed procedures for Cleaning and Disinfection of Dive Gear.

  To the extent possible, the Sci. Diving Pgm will provide PPE and other necessary supplies (gloves, hand sanitizer, wipes etc.) for use in the Dive Locker. These materials will not be provided for field operations; PIs and Lead Divers must ensure these items are available in the field.

Dive Procedures

- To the extent possible, dives should be conducted with static buddy teams.
- Buddy checks and gear familiarization should be conducted from a standard social-distance of 6ft. Divers will inspect and functionally test only their own equipment.
- Water entry/exit should be conducted with masks and regulators donned and in place until social distancing can be achieved.
- If social distancing cannot be maintained, during surface-work, masks and regulators should remain in place.
- If conditions do not allow equipment to remain donned during entry/exit (i.e. exiting to a platform without a ladder), the diver should secure their equipment in the water, exit, and then retrieve their own equipment.

Emergency Equipment & Response

- Air-sharing between divers should be performed only with the 'octopus' unless doing so would result in injury or loss of life.
- In the event of an in-water rescue response, rescuer and victims mask and regulator should remain in place as long as is practical.
- All program-provided O2, First Aid kits, etc. will be prepared by the DSO following appropriate hygiene procedures.
    - Users must inspect FA kits prior to deployment.
    - Inspections must be performed while wearing gloves and face-coverings.
    - All returned kits must be externally disinfected by the user when returned.
    - Notify the DSO if any materials have been used.

+++ Cleaning and Disinfection of Dive Gear +++

- All divers are encouraged to watch Divers Alert Network on-line presentation "Disinfecting Scuba Equipment" or read DAN Article "Disinfection of Scuba Equipment and COVID-19".
- All personal dive gear will be cleaned/decontaminated according to the procedure below.
- Care must be taken not to cross-contaminate gear during and after cleaning. Divers should handle only their own gear. Do not touch masks, mouth pieces, etc. with unwashed hands.

STEP 1- Initial Rinse/Gross De-Con- with gear in personal totes, rinse all dive gear with running fresh water and allow to soak to remove sand, salt, and other debris.

STEP 2- Disinfect- disinfection of dive gear is recommended but not required. If divers are confident their gear has not been cross-contaminated, disinfection is optional. Divers who choose to disinfect should choose and follow one of the procedures listed below.

-Specific guidance for mixing/use of available disinfectants will be posted at the rinse station-

Disinfect (Bucket)- aliquot appropriate amount of disinfectant solution (TBD) into 3-5G bucket, fill with fresh water, submerge equipment, and allow to soak/stand for allotted time.

Disinfect (Tote)- drain initial rinse-water from personal tote. Aliquot appropriate amount of disinfectant solution into tote, fill with fresh water, submerge equipment, and allow to soak/stand for allotted time.

Disinfect (Spray)- hang gear on rack/rod and spray thoroughly with provided disinfectant. Allow to stand for allotted time.
**Spray recommended for exterior surfaces only, not regulators/snorkels.*

STEP 3- Final Rinse- rinse gear with running fresh water. ** if indicated by chosen disinfectant*

NOTE- during all phases of cleaning, water conservation should be considered. While cleaning and disinfection is a priority, divers should utilize care to minimize water-use and wastewater generation. This is particularly important at the UMaine Darling Marine Center.

+++ Breathing Air Cylinders and Fill Station +++

- All cylinders must be rinsed with running fresh water prior to being moved to the fill station.

- The number of operators at the Darling Marine Center fill station will be limited to one (1) at a time.

- Fill station operators must wash their hands prior to and after fill operations.
  **Due to the potential risk of fire, alcohol-based hand sanitizers/wipes are not to be used at the UMaine the fill station.*

- Fill station operators will wear face coverings or masks during fill operations.

- Cylinder valves and any/all fill station equipment handled by the fill operator must be disinfected prior to and after fill operations using disinfectant wipes or solutions provided. **Caution must be exercised to avoid injecting disinfectants and/or water into cylinders during/after the cleaning process.*

Appendix 1
+++Hierarchy of Controls Worksheet+++

See Excel attachment

Hierarchy of Controls- Scientific Diving Tasks (COVID-19)

CONTROL TYPE	Elimination Controls		Substitution Controls		Engineering Controls			Administrative Controls					Protective Equ	Special	
GROUPS / TASKS	Essential?	In person?	Lesser hazard	1 person?	Ventilation?	Mechanical Advantage?	Other Engineering Control?	Work Practice Controls	Off standard shift work?	Rotation?	Group Size / Distancing	Other Administrative Control?	Recommend PPE?	Face covering?	Cleaning/Disinfection
Scientific Diving															
Sci. Diving-Operational	If deemed so by OVPR	Yes	N/A	N/A	outdoors	N/A	N/A	Social distancing- 6ft when possible			Reduce to minimum number of dive team members + boat person (if	Consider shore dives in place of boat dives		Yes, while on shore/boat as practicable	See UMaine Sci. Diving SOP
Sci. Diving- Gear Prep/Cleaning	Yes	Yes	N/A	N/A	outdoors	N/A	N/A	Each diver handles and cleans only their own scuba equipment.		Divers clean equipment in 2 diver rotations; other team members conduct other tasks	Reduce to minimum number of dive team members			Yes, while on Dive Deck; in Dive Locker	See UMaine Sci. Diving SOP
Sci. Diving- Cylinder Filling	Yes	Yes	N/A	N/A	Indoor- ventillation fan	N/A	N/A			Rotate workers to maintain 1 person operations	1 person			Yes	See UMaine Sci. Diving SOP

Appendix 2

+++DMC Protocol for ‘Return to Campus’ and ‘Conducting Essential Research+++

Due to the potential for rapidly changing conditions, users should reference posted guidance at:
www.dmc.maine.edu

Appendix 3
+++Disinfection of Scuba Equipment+++

Disinfectant type- The UMaine Scientific Diving Program has chosen Simple Green DPro5 (DP5) for disinfection of scuba gear. This product is listed as a Tier 1 substance by the USEPA and is in compliance with EPA's *Emerging Viral Pathogen Guidance for Antimicrobial Pesticides,* during COVID-19.

SDS- The Safety Data Sheet for this product can be found in the UMaine Dive Locker SDS binder and is also posted at the Disinfectant station.

Instructions for Use

Spray bottles- 32 oz spray bottles are provided for use on hard surfaces in the Dive Locker and Air Fill Station only. These bottles contain ready-to-use, pre-diluted DP5 prepared by the Diving Safety Officer. If spray is needed and the bottle is empty, refill with pre-diluted stock, or follow instructions for dilution and mixing below.

Stock 1G containers- 1 Gallon containers of full-strength, undiluted DP5 are provided for dilution and mixing as noted below.

Dilution : Mixing Table- the table below lists ratios for preparation of DP5 disinfecting solutions.

Container	Simple Green D Pro 5	Dilute with water to
Spray Bottle	**1oz**	**32oz**
Pre-diluted	**2oz**	**1 Gallon**
5G Bucket	**4oz**	**2 Gallons** (5-6 inches of water per 5G bucket)
Fish tote	**10oz**	**5 Gallon** (3 inches of water per fish tote)

Contact time- allow a minimum 10-minute contact time for all equipment and surfaces to be disinfected prior to rinsing or wiping.

PLEASE CONSERVE!

During all phases of cleaning, conservation of both disinfectant and water should be considered. Disinfectant is in short-supply, and while cleaning and disinfection is a priority, divers should utilize care to minimize water-use and wastewater generation.
This is particularly important at the UMaine Darling Marine Center.

Appendix 4
+++UMaine Medical Assessment of Divers Following COVID-suspected Illness+++

Diver Name: _____ Date: _____

COVID-19 SYMPTOMS

Since January 2020: *(Please circle)*

1. Have you had a positive swab (PCR) or blood (antibody test) for COVID-19? NO YES
   If Yes, date of test(s): _____
2. Have you had any of the following symptoms and suspect they may have been related to COVID-19 Illness? (check all that apply) NO YES
   - ☐ *cough* ☐ *fever* ☐ *headache*
   - ☐ *shortness of breath* ☐ *chills* ☐ *loss of taste or smell*
   - ☐ *difficulty breathing* ☐ *shivering* ☐ *diarrhea*
   - ☐ *sore throat* ☐ *muscle aches*
3. Did you miss any days of work due to the above symptoms? NO YES
4. Have you had severe respiratory illness with clinical or x-ray evidence of pneumonia, or acute respiratory distress syndrome? NO YES
5. If YES to question 2-4, were you diagnosed with any respiratory illness other than COVID-19? If Yes, what illness: _____ NO YES
6. Are you having any symptoms currently? NO YES
7. Do you feel anxious or depressed about the COVID-19 pandemic or working? NO YES

EXERCISE TOLERANCE:

1. Describe your normal exercise routine: _____
2. Any changes in your ability to perform your normal exercise or exertion? NO YES
3. If YES to question 2, why can't you perform your normal exercise? _____

_____

If you answered ***'NO'*** to all of the questions above, and have a current *UMaine Diver Medical Exam* on file, no further evaluation is required. Please submit this form to the UMaine Diving Safety Officer.

If you answered ***'YES'*** to any of the above questions, additional screening by a medical provider is required. The screening should follow the recommendations for *Medical Assessment of Divers Following COVID-suspected Illness* found on page 2 of this document as well as the standard *UMaine Diver Medical Exam* and *Medical History Report.* When complete, please submit this form AND a newly completed UMaine Diver Medical Exam to the UMaine Diving Safety Officer.

PHYSICIAN'S STATEMENT: I have evaluated this individual according to the *Medical Assessment of Divers following COVID-suspected Illness* and provided my recommendations on the *UMaine Diving Medical Exam Overview for the Examining Physician.*

Physician Signature: _____, M.D./ D.O. Date:_____

Physician Name (Print): _____

University of Maine
Medical Assessment of Divers Following COVID-suspected Illness

Classification of divers based on severity of COVID-19 suspected illness

Category 0 ***NO*** *history of COVID-19 suspected illness*	**Category 1** ***MILD*** *COVID-19-suspected illness*	**Category 2** ***MODERATE*** *COVID-19-suspected illness*	**Category 3** ***SEVERE*** *COVID-19-suspected illness*
Definition: Divers who have no history of COVID-19 suspected illness should proceed with normal evaluations. Additionally, we would use these criteria in those who may have had a positive screening PCR or antibody test, but without any history of illness or symptoms consistent with COVID-19.	Definition: • Did not seek health care or received outpatient treatment only without evidence of hypoxaemia. • Did not require supplemental oxygen • Imaging was normal or not required	Definition: • Required supplemental oxygen or was hypoxic • Had abnormal chest imaging (chest radiograph or CT scan) • Admitted to the hospital but did NOT require mechanical (intubation) or assisted ventilation (BIPAP, CPAP) or ICU level of care. • If admitted, had documentation of a normal cardiac work up including normal ECG and cardiac biomarkers e.g. troponin or CK-MB and BNP	Definition: • Required mechanical (intubation) or assisted ventilation (BIPAP, CPAP) or ICU level of care. • Cardiac involvement defined as abnormal ECG or echocardiogram, or elevated cardiac biomarkers; e.g. troponin or CK-MB and BNP (or absence of documented work up) • Thromboembolic complications (such as PE, DVT, or other coagulopathy)

Recommendations for evaluations of divers or diving candidates

Category 0 ***NO*** *history of COVID-19 suspected illness*	**Category 1** ***MILD*** *COVID-19-suspected illness*	**Category 2** ***MODERATE*** *COVID-19-suspected illness*	**Category 3** ***SEVERE*** *COVID-19-suspected illness*
• Initial/periodic exam per ADCI guidelines • Chest radiograph only if required per professional group • No additional testing required	• Initial/periodic exam per ADCI guidelines • Spirometry • Chest radiograph (PA & lateral); if abnormal, obtain chest CT • If unknown (or unsatisfactory) exercise tolerance*, perform exercise tolerance test with oxygen saturation	• Initial/periodic exam per ADCI guidelines • Spirometry • Chest radiograph (PA & lateral); if abnormal, obtain chest CT • ECG • Echocardiogram (if no work up was done as an inpatient. Can forgo if had negative work up) • If unknown (or unsatisfactory) exercise tolerance*, perform exercise tolerance test with oxygen saturation • Investigation and management of any other complications or symptoms per provider and professional group or RSTC guidelines	• Initial/periodic exam per ADCI guidelines • Spirometry • Chest radiograph (PA & lateral); if abnormal, obtain chest CT • ECG • Repeat cardiac troponin or CK-MB and BNP to ensure normalization • Echocardiogram • Exercise Echocardiogram with oxygen saturation • Investigation and management of any other complications or symptoms per provider and professional group or RSTC guidelines

** If the physician is not assured the diver's self-reported exercise level meets appropriate criteria or is concerned it would not reveal underlying cardiac or pulmonary disease, further testing is warranted.*

Adapted from : Charlotte Sadler, Miguel Alvarez Villela, Karen Van Hoesen, Ian Grover, Michael Lang, Tom Neuman, Peter Lindholm. Diving after SARS-CoV-2 (COVID-19) infection: Fitness to dive assessment and medical guidance. Diving and Hyperbaric Medicine. 2020 30 September;50(3). doi: 10.28920/dhm50.3