

The



quatic

eterinarian



*Dolphins leaping for joy!
See article on page 22.
Photo credit:
Medical University of South Carolina.*

Marine Mammal Issue

Volume 11, Number 4
Fourth Quarter, 2017



WHO ARE WE**MISSION**

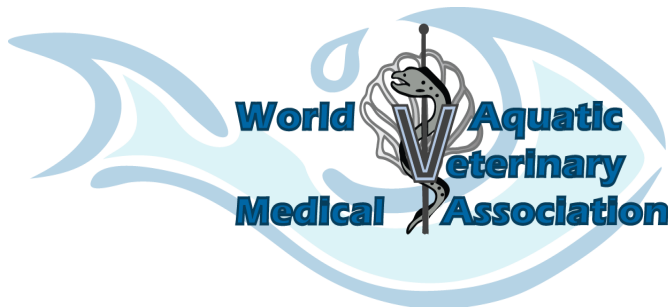
The Mission of the World Aquatic Veterinary Medical Association is to serve the discipline of aquatic veterinary medicine in enhancing aquatic animal health and welfare, public health, and seafood safety in support of the veterinary profession, aquatic animal owners and industries, and other stakeholders.

OBJECTIVES

- A.** To serve aquatic veterinary medicine practitioners by developing programs to support and promote our members, and the aquatic species and industries that they serve;
- B.** To be an advocate for, develop guidance on, and promote the advancement of aquatic animal medicine within the veterinary profession and with associated industries, governments, non-governmental entities and members of the public;
- C.** To develop and implement aquatic veterinary education programs, certifications and publications, including a credentialing process to recognize day-one competency in aquatic animal medicine;
- D.** To foster and strengthen greater interactions among: aquatic veterinarians, related disciplines, veterinary allied and supportive groups and industries, governments and animal owners.

The ideas presented in this publication express the views and opinions of the authors, may not reflect the view of WAVMA, and should not be implied as WAVMA recommendations or endorsements unless explicitly stated.

Information related to the practice of veterinary medicine should only be used within an established valid Veterinarian-Patient-Client Relationship.



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ISSN 2329-5562

Editorial Staff

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Executive Editor

Communications Committee:
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Treasurer

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Director-at-Large

Trista Welsh (USA) trista.welsh@gmail.com
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Editor's Note

Growing up in Wichita, Kansas, in the middle of the United States, far from any ocean, it is surprising that I was interested in fish from an early age. However, my interest came from keeping aquarium fish, originally guppies in a 5-gallon aquarium, rather than from being near the ocean. To this day, I am not really interested in being near the ocean, as I now live in the middle of the Sonora Desert in Arizona. But, I still have fish! Many aquariums as well as a koi pond in my yard. Yet, I have never had any experience working with marine mammals.

Marine mammals are certainly interesting, and very unique creatures when compared to the normal veterinary patients of dogs, cats, horses, cows and other land animals. And even those of us who work with fish on a daily basis realize the differences between the gill-breathing patients versus the warm-blooded, air-breathing marine mammals. For some veterinarians, they have tremendous appeal, and there are fascinating opportunities for the lucky few veterinarians who find careers working with them.

While our normal focus in the World Aquatic Veterinary Medical Association is fish medicine, we like to cover a variety of topics relevant to Aquatic Veterinarians, so I hope you enjoy this issue focused on marine mammals. There are articles and abstracts about many species of marine mammals, starting with centerfold photos on pages 20-21.

I also wish you the very best in this end-of-year Holiday Season, and a very happy and prosperous 2018!

Merry Christmas!

Nick Saint-Erne, DVM, CertAqV
Executive Editor
TAVeditor@wavma.org



Download a QR reader onto your Smart Phone and scan the Quick Response Code to the right. It will take you to the WAVMA.org website page for accessing all of the past WAVMA Newsletters.



You will need your WAVMA User ID and Password to access the most recent issues of *The Aquatic Veterinarian*.

The latest editions are available for download at <https://www.wavma.org/TAV-Current-Issues>.

Past years' editions are available for download at <https://www.wavma.org/TAV-Archives>.

Cover Photo:

Dolphins from article starting on page 22. Photo credit MUSC.



The Aquatic Veterinarian

The Quarterly Magazine of the World Aquatic Veterinary Medical Association

Consider promoting your products, services or programs to aquatic veterinarians, veterinary students, nurses & paraveterinary professionals throughout the world

Advertising Rates (per issue)

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1/2 page (~7" x 4.5") or 1 column (3.5" x 9")	\$60	\$30
1/4 page (~3.5 x 4.5")	\$30	\$15

WAVMA Members

Free 1/8 page (business card size) advertisement
Contact TAVeditor@wavma.org for information on advertising and payment options.

President's Report

We are moving fast to the end of the year. Looking back in the recent past, I feel that current years tend to pass by quicker than in the times of my childhood, for instance. It seems to me that this year did not make any exception, and went by in the blink of an eye. Whether this is because of the actions and activities having succeeded or the actual effect of shortening the length of the Earth's day, as scientist claim, it is hard to postulate. However, certain is that this is my last President's Report, in which I intend to make an overview of the major activities carried out by the Executive Board and Committees during the year impacting WAVMA and its members. I should also emphasize here that this year's achievements – partly conclusions of actions started in the previous years by Past Presidents, whereas others being projects initiated this year - would not have been possible without the accord and support of the Executive Board and Committees Chairs and members, to whom I wish to thank, by this means.

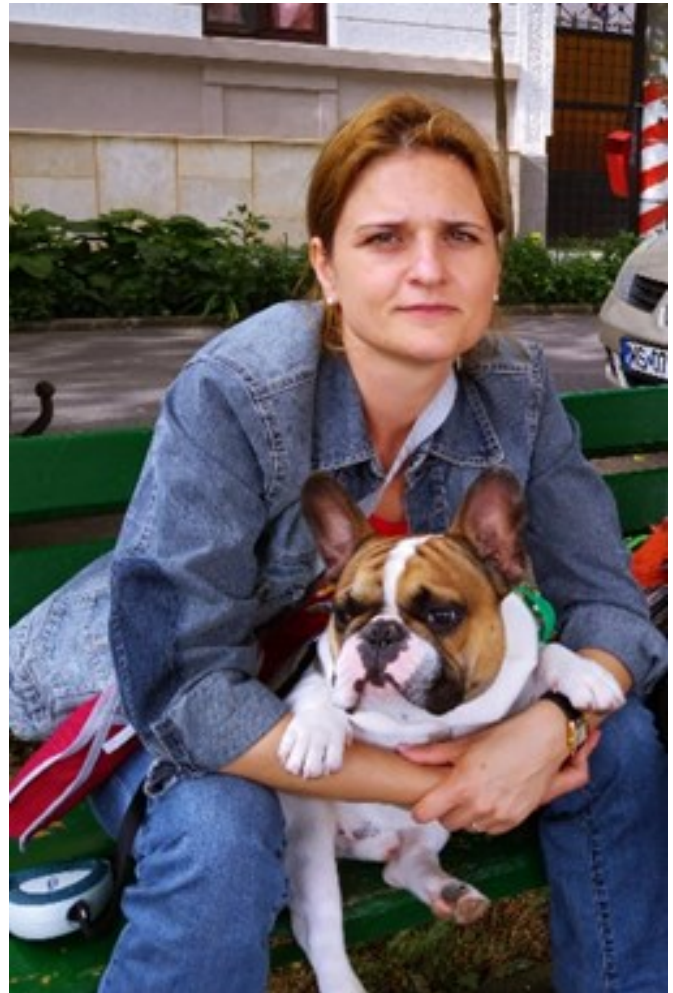
Hence, here it is the year's review in brief:

The WAVMA Bylaws and Executive Board Responsibilities document were updated, voted on, and are both now in use.

The Aquatic Veterinarian Certification Program (CertAqV), which has currently about 50 awardees and another 50 applicants in progress, has continued to be a successful programme also during this year. The Credentialing Committee managed to decide on and implement an email voting system for CertAqV applications. In addition, the Executive Board evaluation of applications is now performed on a quarterly basis, in March, June, September and December. The Committee has also started to revise the certification requirements for future applications. The re-certification process of the first CertAqV awardees commences next year.

The John L. Pitts Aquatic Veterinary Education Awards Program, which has financially supported students and recent graduates from over 40 colleges and universities worldwide, will soon open applications for the year 2018. Up to now, this program has awarded circa \$42,500 and it is foreseen that more funds shall be used to help the applicants broaden their knowledge in aquatic animal health. I wish to thank gratefully to those organisations and people that have donated to this great program. Please, donate now to carry on making dreams come true!

The WAVMA Brochure was refined and translated into French, German, Italian, Portuguese, Romanian and Spanish. The brochure can be downloaded here: <https://www.wavma.org/About-Wavma>



This year, the Executive Board decided to allow members from developing countries to access selected webinars of the WebCEPD program free of charge.

Two new Student Chapters at veterinary schools were established this year, at the **Oregon State University, USA** and the University of Pretoria, Onderstepoort, South Africa.

The Distinguished Fellows Committee awarded this year the honorarium to Dr. Nick Saint-Erne for his contribution to the development of aquatic veterinary medicine. Dr. Saint-Erne has been a member of WAVMA since its first year, and has been a n Executive Board Member as President and as Treasurer, and is on several committees. He has been practicing Aquatic Veterinary Medicine for over 30 years.

This year is also the year that WAVMA started closer collaboration with the prestigious Fish Veterinary Society (FVS) as a WAVMA affiliate member. Additionally, WAVMA is developing an overarching policy as guidance on aquatic animal welfare for WSAVA, and is establishing a working group for development of WVA aquatic animal welfare fact sheet. This is establishing WAVMA as a worldwide voice for aquatic veterinary

medicine. As a side note, it is very likely that, in the near future, Directors-at-Large will be chosen to represent geographic regions.

On 12-14 September 2017 WAVMA held its stand-alone Conference and Annual General Meeting, "Current Concepts in Aquaculture and Ornamental Fish Practice", in Targu Mures, Romania. The Conference included oral and poster presentations on Aquaculture and Ornamental Fish Practice. The conference hotel was wonderfully accommodating and the meeting was a great success.

Due to time constraints, I handed over the WAVMA monthly e-News publication, to our younger colleague, Miguel Grilo, who is now the editor-in-charge. He will continue with monthly publications via email to keep our members up-to-date. Please forward any news you would like to send members to him.

Zeev Noga (WVA, Secretary) was granted a one-year honorary WAVMA membership as a token of appreciation for all his efforts in supporting WAVMA throughout the years.

Executive Board members are currently developing the description of the newly revised Education Committee. Upon approval by the Board, general members shall be invited to sit on this Committee.

These are the main 2017 activities, and many more are planned for the next years to come for WAVMA, so please stay in touch and renew your WAVMA membership for 2018.

I would like to take this opportunity to thank all WAVMA members for their continued membership. I wish to also gratefully thank the Executive Board 2017 - with special thanks to our Treasurer, Dr. Sharon Tiberio, and to the Committees' Chairs for their hard work on making all the above activities possible. It has been a great honor to serve as the WAVMA President! Happy Holidays to all!

With my best wishes,

Laura Urdes, PhD DVM PgDip CertAqV
WAVMA President 2017
Bucharest, ROMANIA
president@wavma.org

**Discover core knowledge, skills & experience
needed to become a WAVMA Certified Aquatic
Veterinarian (CertAqV)**

Did you know that WAVMA's **CertAqV Program** offers members the opportunity to become recognized and certified as having competency in 9 core areas deemed necessary to practice aquatic veterinary medicine? Find out more information online at:
<http://www.wavma.org/CertAqV-Pgm>.

Secretary's Report

Dear WAVMA members,

I am writing this report after being entrusted with the responsibility as Secretary of WAVMA since 2014. It was a pleasure serving you and advancing the noble causes of WAVMA in this capacity. I wish my successor Dr. Stephen Reichley all the best as he assumes the role as WAVMA secretary.

The year 2017 has seen members continuously taking advantage of the benefits offered by WAVMA as an association. The Executive Board, led by Dr. Laura Urdes with the support of the Communications, Credentialing, Meetings, Members and Student's Committees, has been working assiduously to improve these benefits.

As secretary, I have been the primary and often first contact with WAVMA as an organization and it is encouraging to see the interest shown in what we do by veterinary students, veterinarians, pet owners and the public. Information was shared during the year from partners and international organizations that are relevant to us as aquatic veterinarians, such as the Commonwealth Veterinary Association (CVA), World Small Animal Veterinary Association (WSAVA), and World Veterinary Association (WVA). I hope that such information has been of help you.

Since the responsibility of the Secretary includes matters related to communication both to the public and to WAVMA members, effective 2016 it was decided that the Secretary serve as the Chair of the Communications Committee. I am happy to report that the members of that committee have been very supportive in ensuring that all communication tools at our disposal are working well to achieve this goal.

The results of active communication are best reflected in the response to WAVMA programs. The year 2017 saw more persons becoming CertAqV certified, bringing the total to 62, demonstrating the importance members place on the program. Members have also been contributing to and reading our publications. The discussions in the Listerv are lively and instructional and provide a mutual platform for both veterinarians and veterinary students to communicate. Webinars continue to be popular resource for both WAVMA members and the public. The University of Pretoria, Onderstepoort Faculty of Veterinary Science School Chapter, which was established in 2017, brought the total of student chapters to 13.

Finally, as Secretary, a role that is important is the fostering of productive relationships and collaborative efforts with other organizations. Such endeavors have helped to strategically place aquatic medicine on the agenda where in many such cases, without the involvement of WAVMA, would have been missing. One such event worthy of mention is the WSAVA confer-



ence in Copenhagen from September 24-28, 2017 where Dr. Laura Urdes, Dr. Chris Walster and Dr. Dusan Pasic collectively presented Aquatic sessions.

The successful hosting of the WAVMA Conference and Annual General Meeting held from September 12-14, 2017 in Targu Mures, Transylvania, Romania is commendable, and I wish to thank all those that helped to organize it and those who participated.

As I close, allow me to congratulate the new Executive Board that will lead us in 2018 under the direction of the founding member Dr. David Scarfe, and I thank the Executive Board that has served us in 2017. I wish you and yours all the best for the festive season and a prosperous New Year.

Devon Dublin, PhD, DMVZ, MSc. CertAqV
WAVMA Secretary
Project Coordinator
Global Environment Facility - Satoyama Project
Conservation International Japan
201 Leoplace FONTEINE
37-14 Hatsunegaoka
Hodogaya-ku,
Yokohama, Kanagawa
240-0016
Japan
Secretary@wavma.org



Treasurer's Report

2017 has been a stellar year for WAVMA fiscally, with a record projected treasury balance of approximately \$35,000. Reaching this financial milestone will enable WAVMA to expand educational objectives and provide for greater meeting participation in 2018.

As in past years, a large part of our funding has come from membership dues, CertAqV applications and Pitts Educational Award donations. This year, some income was generated as a result of partnering with the International Aquatic Veterinary Biosecurity Consortium to host a special session at World Aquaculture 2017 in Cape Town, South Africa, in addition to presenting a 3 day scientific conference in Targu Mures, Romania. New in 2017 was consistent financial support from advertising sponsors. And through the sheer generosity of EB and committee members who volunteer their time, WAVMA receives "donations in like kind" by all those who represent and volunteer for WAVMA without compensation.

Most 2017 expenditures were associated with providing conferences, along with WAVMA participation in, and sponsorship of, educational meetings such as the American Veterinary Medical Association Convention, Aquaculture America, the Fish Veterinary Society Conference, the World Small Animal Veterinary Association Congress, and the World Veterinary Congress. Other recurring costs, such as for office/website/webinar expenses, bank transactions and corporate fees were in alignment with previous years and on budget.

As this year draws to a close so does my 3 year commitment as treasurer. It has been an honor and privilege to serve on the Executive Board. Volunteering my time to WAVMA has been a rewarding experience, I will truly miss working side by side with so many exceptional colleagues. I would encourage all members to consider actively supporting and improving this great organization in whatever capacity they feel comfortable by sitting on a committee, running for a Board position, giving a webinar, or submitting an article to *The Aquatic Veterinarian*. Our diversity in aquatic animal experience, perspectives and professional interests strengthens our discipline as well as WAVMA.

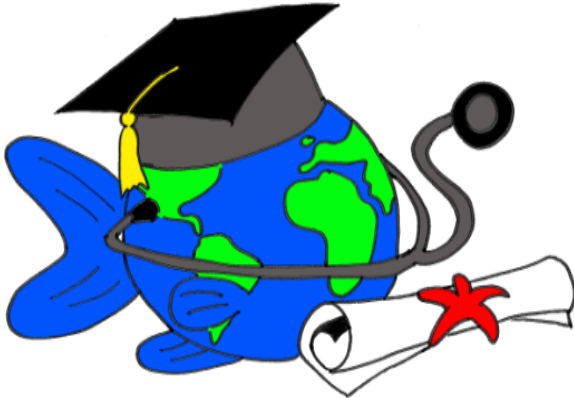
I am sending warm wishes to all for a joyous holiday season and a happy, healthy and bright 2018! All the best,

Sharon Tiberio, DVM, CertAqV
WAVMA Treasurer
My Fish Vet, Inc.
Dallas, Texas, USA
Treasurer@wavma.org
stiberio@att.net

PRIVILEGES & BENEFITS OF WAVMA MEMBERSHIP

Aquatic Veterinary e-Learning

Supporting WAVMA's WebCEPD, PubCEPD
CertAqV & Clinical Cases Programs.



- Enjoy on-line *e-Learning* programs & courses to advance your knowledge & skills
- Get continuing education credit through *WebCEPD, PubCEPD & Clinical Corner*
- Discover core knowledge, skills & experience needed to become a WAVMA Certified Aquatic Veterinarian (*CertAqV*)
- Receive *discounted* subscriptions to publications & meetings
- Utilize WAVMA's *picture & video libraries* for your own presentations
- Join *listservs* to discuss clinical cases & other issues
- Mentor & be mentored to expand your and other's aquatic veterinary skills
- Publish your articles in WAVMA's quarterly journal: *The Aquatic Veterinarian*
- Find world-wide externships, internships, residencies & jobs in all aquatic vet areas
- Access *Member Directories* & have your Clinic/Hospital listed on-line
- Benefit from *Educational grants* for vet students & new veterinary graduates
- Form & participate in *veterinary school chapters* throughout the world
- Participate in veterinarian and client surveys
- Help build additional member programs by serving as an Officer, Director or Committee Member

WAVMA Committees

As a member-driven organization, WAVMA relies on volunteers to help implement programs useful for all members. Any WAVMA member can volunteer on a Committee to help shape the direction of the Association, meet new colleagues, forge valuable and lasting relationships, and help address key issues affecting aquatic veterinary medicine today. To find out more about serving on a Committee, please contact the Committee Chair or the WAVMA Parliamentarian.

Budget and Finance Committee

This Committee develops and regularly revises the Association's annual budget and assists the Treasurer, as necessary, in developing the Association's annual financial reports and tax materials.

This Committee shall consist of the Treasurer (Chair); the President-Elect; and one other member of the Executive Board who will volunteer to serve a one-year renewable term.

Chair: Sharon Tiberio, Treasurer@wavma.org

Communications Committee

This Committee manages the communications among members and others involved with aquatic veterinary medicine. It oversees the listservs, membership lists, publication of WAVMA's quarterly journal *The Aquatic Veterinarian*, e-News, Facebook, Twitter, LinkedIn and other social media accounts.

Chair: Devon Dublin, DevDub@yahoo.com

Credentialing Committee

This Committee oversees and administers the Cert-AqV Program for credentialing aquatic veterinary practitioners, and evaluates aquatic veterinary educational programs useful to members.

Chair: Tim Miller-Morgan tim.miller-morgan@oregonstate.edu

Meetings Committee

This Committee oversees and coordinates logistics for WAVMA-organized or sponsored aquatic veterinary educational meetings, including the Annual General Meeting.

Chair: Julius Tepper, cypcarpio@aol.com

Membership Committee

This Committee oversees membership issues to optimally serve individual members and the organization. Chris Walster, chris.walster@onlinevets.co.uk

Student Committee

This Committee facilitates networking between student members and helps development of student programs and services.

Chair: TBD

Credentialing Committee

The WAVMA CertAqV Program is administered by the WAVMA Credentialing Committee, along with the assistance of other Certified WAVMA members who serve as mentors and adjudicators.

To be credentialed by WAVMA as a Certified Aquatic Veterinarian and utilize the CertAqV honorific, individuals must be a WAVMA member, have a veterinary degree from a nationally recognized veterinary school, college or university and have demonstrated general knowledge and competency in core subject areas that are currently considered necessary to practice aquatic veterinary medicine. Students of a nationally recognized veterinary institution of higher education can register for the program, but will not be certified or entitled to utilize the CertAqV honorific until they graduate.

Individuals that desire to participate in the WAVMA CertAqV Credentialing Program are required to:

- Register for the Program (application at <https://www.wavma.org/CertAqV-Pgm>).
- Identify a mentor to assist the registrant through the Program. The potential mentors would be available WAVMA Certified Aquatic Veterinarians.
- Provide the mentor with written evidence of satisfactory completion of each of the core Knowledge, Skills and Experience (KSE) subject areas.
- Be adjudicated by the Credentialing Committee for recognition of completion of all KSE requirements after the mentor has approved the documentation.
- Have the CertAqV certification approved by the WAVMA Executive Board.

The WAVMA Certified Aquatic Veterinarian (CertAqV) program has now certified 65 aquatic veterinarians from 20 countries. Congratulations on our newest Certified Aquatic Veterinarians:

Dr Ashley Emanuele,
Dr Parinda Kamchum,
Dr Dan Morick

There are an additional 48 other WAVMA members currently in the process of being certified. For more information, see the WAVMA website:

<http://www.wavma.org/CertAqV-Pgm>.

Tim Miller-Morgan, DVM, CertAqV
2017 Credentialing Committee Chair

Certified Aquatic Veterinarians

Giana Bastos-Gomes	Australia
Heather Bjornebo	USA
James Bogan	USA
Todd Cecil	USA
Michael Corcoran	USA
Emily Cornwell	USA
Darren Docherty	UK
Simon Doherty	UK
Devon Dublin	Japan
Mohamed Faisal	USA
Ari Fustukjian	USA
Christopher Good	USA
Krystan Grant	USA
Stephanie Grimmett	UK
Orachun Hayakijkosol	Australia
Kerryn Illes	New Zealand
Jimmy Johnson	USA
Colin Johnston	New Zealand
Kasper Jorgensen	Denmark
Brian Joseph	Canada
Elizabeth Kaufman	Israel
Amy Kizer	USA
Jack Kottwitz	USA
Eric Littman	USA
Richard Lloyd	UK
Richmond Loh	Australia
Adolf Maas	USA
David Marancik	Grenada
Matthijs Metselaar	UK
Tim Miller-Morgan	USA
Haiham Mohammed	Egypt
Alissa Mones	USA
Ross Neethling	UK
Dušan Palić	Germany
Brian Palmeiro	USA
Christine Parker-Graham	USA
David Pasnik	USA
Ayanna Phillips	Trinidad & Tobago
Jena Questen	USA
Aimee Reed	USA
Stephen Reichley	USA
Komsin Sahatrakul	Singapore
Nick Saint-Erne	USA
Jessie Sanders	USA
David Scarfe	USA
Khalid Shahin	UK
John Shelley	USA
Melissa Singletary	USA
Esteban Soto	USA
Win Surachetpong	Thailand
Gillian Taylor	South Africa
Julius Tepper	USA
Sharon Tiberio	USA
Laura Urdes	Romania
Greta Van de Sompel	Belgium
Sarah Wahlstrom	USA
Chris Walster	UK
Scott Weber	USA
Trista Welsh	USA
Peter Werkman	Holland
Howard Wong	Hong Kong
Irene Yen	St. Kitts & Nevis

Fellows Advisory Council

WAVMA has established a fellowship program to recognize those world-renowned veterinarians who have advanced aquatic veterinary medicine as a discipline and devoted their time and efforts to serve WAVMA's mission. The Fellows Advisory Council allows Fellows to advise the Executive Board with guidance on their initiatives, and mentor applicants for Aquatic Veterinarian Certification (CertAqV).

Our WAVMA Distinguished Fellows are:

Dr Peter L. Merrill
Dr Ronald J. Roberts
Dr A. David Scarfe
Dr Julius M. Tepper
Dr Christopher I. Walster
Dr Dusan Palic
Dr Grace Karreman
Dr Marian McLoughlin
Dr Mohamed Faisal
Dr Nick Saint-Erne

See: <http://www.wavma.org/wavma-fellows.cfm?>

Executive Board Responsibilities

The Executive Board has the responsibility for charting the course of WAVMA, fiduciary oversight of all issues, and, with input of committees, provides the oversight and approval for all WAVMA programs and services that fulfill the Mission and Objectives of the organization. The Board generally meets once a month through teleconferences, to discuss and approve WAVMA programs, services, and policies that drive the organization and issues that affect aquatic veterinary medicine. Members may submit items for discussion at the next Executive Board by contacting the [WAVMA Secretary](#).

WAVMA Shop

A number of WAVMA branded items
(including shirts, mugs, caps) are available
at the WAVMA Store. Get yours today!



Go to: <http://www.wavma.org/Shop>

WAVMA VETERINARY SCHOOL CHAPTERS

<https://www.wavma.org/WAVMA-Student-Chapters>

Auburn University, [College of Veterinary Medicine](#) (established 2013)

2016 Officers - Kate Butzen (President), Patricia Debow (Vice President), Erika Gibson (Treasurer), Lindsay Lawreck (Secretary); **Faculty Advisors** - Drs. Ray Wilhite & Jack Kottwitz; **Chapter Contact** - [click here](#).

Mississippi State University, [College of Veterinary Medicine](#) (estd 2014)

2016 Officers - Elizabeth Works (President), Taylor James (Vice-President), David Mills (Treasurer), Madeleine Hendrix (Secretary); **Faculty Advisor** - Dr. Wes Baumgartner; **Chapter Contact** - [click here](#).

Murdoch University, [School of Veterinary & Life Sciences](#) (estd 2014)

2016 Officers - Ming Jun Lim (President), Cheryl Tan (Vice President), Chermaine Lim (Treasurer), Jia Wen Lim (Secretary); **Faculty Advisors** - Drs. Lian Yeap & Richmond Loh; **Chapter Contact** - [click here](#).

Ross University, [School of Veterinary Medicine](#) (established 2015)

2016-2017 Officers - Larissa Menke (President), Erika Brigante (Vice President), Jean Fournier (Secretary), Robin Sayres (Treasurer), Michelle Sparks (Wetlab Coordinator), Mandy Murti (Fundraising Chair); **Faculty Advisors** - Drs. Don Bergfelt & Mark Freeman; **Chapter Contact** - [click here](#).

Oregon State University, [College of Veterinary Medicine](#), USA (estd 2017)

2017 Officers - Katharine Onofryton (President), Holly Arnold (Vice-President), Linda Yang (Secretary), Katie Royer (Treasurer), Courtney Pace (lab coordinator); **Faculty Advisor** - Dr. Tim Miller-Morgan; **Chapter Contact** - [click here](#).

Tuskegee University, [School of Veterinary Medicine](#) (established 2012)

2016 Officers - Jacqueline Elliott (President), Jennifer Algarin (Vice Prs), Jennifer Algarin (Secrty), Aaron Judson (Treas.), Ayxa Rosado (Historian), TBD (Fundraising Chair); **Faculty Advisor** - Dr. Kenneth Newkirk; **Chapter Contact** - [click here](#). View the Chapter's [Facebook](#) page.

University of Florida, [College of Veterinary Medicine](#) (established 2013)

2016 Officers - Haley Violetta (President), Riley Shugg (Vice President), Kaylee Brown (Treasurer), Megan Joyce (Secretary); **Faculty Advisor** - Dr. Tom Waltzek; **Chapter Contact** - [click here](#).

University of Georgia, [College of Veterinary Medicine](#) (established 2015)

2016 Officers - Kristina Pascutti / Laura Burns (Co-Presidents), Sara Collins (Vice-President), Jaclyn Levin (Treasurer); **Faculty Advisor**, Dr. Alvin Camus; **Chapter Contact** - [click here](#).

University of Minnesota, [College of Veterinary Medicine](#) (established 2016)

2016 Officers - Sarah Knowles (Chair), Angela Jackson (Secretary); **Faculty Advisor** - Dr. Amy Kizer; **Chapter Contact** - [click here](#).

University of Pretoria, Onderstepoort [Faculty of Veterinary Science](#), South Africa (established 2017).

2017 Officers - Varushka Naidoo (Chair), Aaminah Vahed (Dpty Ch), Joanet Van Zyl (Secretary), Jodi Botha (Treas), George Woodley (Social Media), Robynne Britz & Vianca Naidu (Funding); **Faculty Advisor** - Dr. Jan Myburg; **Chapter Contact** - [click here](#).

University of Sydney, [Faculty of Veterinary Science](#) (established 2014)

2016 Officers - Ellen Rasidi (President), Arthur Chau (Secretary), Dr. Paul Hick (Treasurer); **Faculty Advisor** - Dr. Paul Hick; **Chapter Contact** - [click here](#).

University of Tennessee, [College of Veterinary Medicine](#) (estd 2012)

2012/13 Officers - Wesley Siniard & Grace Normann (Co-Presidents), Krista Lipe (Vice President), Carrie Dobey (Secretary), Samantha Schraith (Treasurer), Bree Dell (Wetlab Coordinator); **Faculty Advisors** - Dr. Michael Jones & Dr. Debra Miller; **Chapter Contact** - [click here](#). View the Chapter's [Facebook](#) page or [website](#).

University of Wisconsin-Madison, [School of Veterinary Medicine](#)

(established 2014) **2016 Officers** - Katherine Hausmann (President), Nikki Wuestenhagen (Vice President), Geoffrey Gieni (Secretary), Jenna Newman (Treasurer), Jenna Epstein (Activities Coordinator); **Faculty Advisor** - Dr. Mike Collins; **Chapter Contact** - [click here](#).

Western University of Health Sciences, [College of Veterinary Medicine](#)

(established 2014). **2016 Officers** - Andrew Switaj (President), Alexis Wohl (Vice President), David Abolnik (Secretary), Hali Jungers (Treasurer); **Faculty Advisor** -Dr. Suzana Tkalcic; **Chapter Contact** - [click here](#). View the Chapter's [Facebook](#) page.

Click here to get [WAVMA Student Chapter Guidelines](#) .

John L. Pitts Education Awards Program

We are inviting colleagues to collaborate with us in advancing the vision of the John L. Pitts Aquatic Veterinary Education Awards Program and impacting the future of aquatic animal health. The Program is global in its perspective, offering veterinary students and recent graduates financial assistance to pursue their interest in aquatic veterinary medicine. To date, the Program has supported 73 veterinary students and recent graduates from 37 colleges and universities across 4 continents.

Will you help us increase available funds for the 2018 awards cycle? **100% of every donation, regardless of the size, goes directly to supporting the future of aquatic animal health.**

You can make donations and find additional information regarding the Program online at: www.wavma.org/scholarships.

Kind Regards,

Stephen Reichley, DVM, PhD, CertAqV
Chair
John L. Pitts Aquatic Veterinary Education Awards Program
stephen.reichley@gmail.com

**TO SUPPORT FUTURE STUDENT
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Aquatic Veterinary e-Learning
Supporting WAVMA's WebCEPD, PubCEPD,
CertAqV & Clinical Cases Programs



WAVMA is on Facebook!



"Like" WAVMA's Facebook Page and join the WAVMA Facebook group to keep up-to-date with WAVMA activities and aquatic veterinary medicine topics from around the world.

Search for WAVMA at www.facebook.com.

The Aquatic Veterinarian is meant to be read as a 2-page spread (like a paper magazine!). To view it this way on your computer, open the pdf document using Adobe Acrobat or Adobe Reader, then go to the menu bar at the top of the computer screen and click on View, then Page Display, then Two Page View. That will allow you to scroll through the issue seeing the cover page by itself first, followed by two pages side by side for the rest of the issue. Doing this, you will be able to see the Centerfold picture in all its ginormous glory!

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Send your article (<1,000 words) with pictures to TAEditor@wavma.org.

Did you know?

WAVMA maintains an aquatic vet video library. Currently the videos cover a wide range of topics, including surgical procedures, diagnostic methods and guidance on how to be an aquatic veterinarian.

The videos can be accessed at: <http://www.wavma.org/WAVMAs-Aquatic-Vet-Video-Library>

In addition, if you have a video that you would like to make available to other WAVMA members, kindly contact WebAdmin@wavma.org.

Communications Committee Report

I am pleased to report that the communications committee has worked collaboratively and diligently to fulfil its mandate as outlined in the description and duties of its existence. The members have been very supportive during the year where new initiatives were explored, while expanding and bettering the existing ones.

Committee members were individually assigned to serve as the liaison with specific committees of WAVMA to directly support them in communication matters and to efficiently communicate their work to the members. We met monthly to provide updates on the different communication matters and to continuously determine the way forward.

The WAVMA e-News provided information on events and topics of interest and was released monthly around the 15th of the month and has been accessed by up to 1,227 recipients. Similarly, *The Aquatic Veterinarian* released on a quarterly basis continued to meet the expectation of readers by keeping members informed on what the office holders and committees are doing, upcoming events in aquatic medicine, information on jobs and educational opportunities, case studies and research papers. During the year the effort was made to have each edition follow a particular theme and the third quarter was dedicated to the WAVMA Conference and Annual General Meeting held from September 12-14, 2017 in Targu Mures, Transylvania, Romania.

The website was monitored continuously for glitches, which were corrected when found. New materials were added as they became available, while existing material was updated as necessary. Special mention is made of the photo and video library, the new member welcome page, the WAVMA Fellows page, Membership Directory and revision to the home page. The committee also maintained the various WAVMA listervs.

Social media, especially LinkedIn and Facebook, continued to be used during the year. WAVMA Facebook page has seen more than 4,100 followers and the WAVMA Facebook group with more than 670 members. Our partners have also been assisting us in getting our message out, such as the WSAVA website where we have been updating our member page; WAVMA was also featured in the Member Spotlight feature of the November edition of the WSAVA e-Bulletin.

I would like to conclude by thanking the general membership for your support throughout the year which included reporting glitches found in the website, submitting material for publication, and interacting on social media. In our bid to have the WAVMA brochure translated into various languages, the gen-

eral membership also volunteered to revise and edit the material and we are most grateful. I ask that the same support be given to the incoming chair of the Communications Committee in his tenure.

Devon Dublin, PhD, DMVZ, MSc. CertAqV
Communications Committee Chair

Meetings Committee

The Meetings Committee 2018 budget was submitted to the Treasurer for USD \$21,500. Budget allocation has been increased slightly taking into consideration attending one of the IVSA annual events. Additional funds may be requested for St. Kitts if needed and will be discussed at the Meetings Committee before approaching the board.

Meetings in which WAVMA participated this year:

- 2017 WVA GA Meeting Incheon, Korea
- 2017 WAVMA Conference and AGM, Tg Mures, Romania
- 2017 WSAVA Conference and GA, Copenhagen

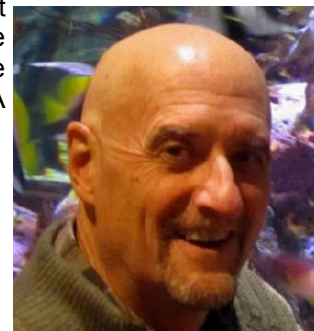
Meetings planned for 2018 includes:

The following are veterinary meetings that WAVMA is attending or sponsoring for 2018:

- 2018 Aquaculture America Conference – Las Vegas, NV (February 19-22)
- 2018 WVA Conference – Barcelona, Spain (May 5-8)
- 2018 WAVMA/RUSVM/IAVBC Conference – St. Kitts (May 17-22)
- 2018 AVMA Convention – Denver, CO (July 13-17)
- 2018 IVSA Conference – Krakow, Poland (July 16-28)
- 2018 ISAAH – Prince Edward Island, Canada (Sept 2-6)
- 2018 WSAVA – Singapore (25-28 September, 2018)

We will have a booth at some of the meetings above and can always use people to help man our WAVMA booth for short periods.

Julius M. Tepper, DVM,
CertAqV
Meetings Committee Chair
cypcarpio@aol.com



Instructions for Authors and Contributors

While any information relevant to aquatic veterinary medicine might be published, we particularly invite contributions for the following regular columns in *THE AQUATIC VETERINARIAN*:

Colleague's Connection

An article explaining why and how a veterinarian became interested in aquatic veterinary medicine and what that veterinarian has done in their aquatic veterinary career.

Peer-Reviewed Articles

Original research or review of any aquatic veterinary topic. Articles will be reviewed by 3 veterinarians and comments and changes referred back to the author prior to publication. The text for an article begins with an introductory section and then is organized under the following headings:

- Materials and Methods
- Results
- Discussion (conclusions and clinical relevance)
- References (cited in the text by superscript numbers in order of citation).

Clinical Cases

Clear description of a distinct clinical case or situation and how it was resolved. These may be submitted for peer-review. Begin with the signalment (species, age, sex, body weight or length) of the animal or animals, followed by a chronologic description of pertinent aspects of the diagnostic examination, treatment, and outcome, and end with a brief discussion.

Book Reviews

Brief review of a published book, including an overview and critique of the contents and where to obtain the book.

Publication Abstracts

Abstracts of published veterinary and scientific journals with full citation/reference (authors, date, title, and journal volume and page numbers – ½-1 page).

News

Brief synopsis or information about aquatic veterinary news published elsewhere. List original source of information.

Legislative & Regulatory Issues

Synopsis or description of emerging legislation or regulations with information on how to access further detailed information or a link to website.

Meetings and Continuing Education and Professional Development (CE&PD) Opportunities

Description or synopsis of upcoming aquatic veterinary or (veterinarian-relevant) non-veterinary in-person or on-line educational meetings noting the meeting title, dates, location, and contact person or website.

Jobs, Internships, Externships or Residencies

Description with specific contact information for veterinary student externships and post-graduate internships or residencies at private practices, institutions, universities or organizations. Description of available full or part-time employment for aquatic veterinarians, with contact information.

Advertising

See advertising rates on page 4.

Please send articles, clinical reports, or news items to the editor by the following submission dates:

- Issue 1 – February 15 (published in March)
- Issue 2 – May 15 (published in June)
- Issue 3 – August 15 (published in September)
- Issue 4 – November 15 (published in December)

All submissions should be in 10-point Arial font, single spaced. Submissions may be edited to fit the space available.

We can also use editors to proof-read submissions or review articles. Please contact the Editor if you are interested in assisting.

The World Aquatic Veterinary Medical Association also has opportunities for members to assist with committees. Contact any member of the Executive Board to volunteer to help.



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Meet Dr. Vasile Vulpe — Iasi, Romania

I am a vet! I like animals and like most the fishes! I received my graduate degree in Veterinary Medicine in 1989 in Iasi, the town where I was born. It's located in the northeastern part of Romania, and it is a region that is rich in waters, ranging from ponds to rivers, and it boasts a decent number of fish farms. Right after having graduated from veterinary school, I worked at a dairy farm for a whole year, and after that, I ended up working as a vet in the research department of a fish pathology station. It wasn't easy, as the shift from working as a farm doctor to studying fish diseases was complicated. But I took it as a challenge and always thought that it would be interesting.

The managers of the research station gave me a time span of several months to become acquainted with what I was supposed to do. I studied everything I found in the libraries of the town regarding fish diseases. At the same time, I became close to the engineers that were working in the production department of the station. That's how I learned the basics of fish biology and behavior; I became acquainted with fishing techniques and many other specific aspects regarding fish farming technologies, as well as their nutrition. I took part in many work meetings on research themes where I met engineers (but no veterinarians) who gave me a lot of good advice at the beginning of my adventure.

The fact that I didn't learn anything about fish pathology while I was studying for my Veterinary Medicine degree was a significant drawback for me. I met engineers who had their degrees in Zootechnics and who knew a lot more about fish diseases compared to veterinarians. Perhaps this was an aspect that made me gritty and drove me to study more about fish pathology in an in-depth manner.



Dr. Vulpe at a fish farm collecting a blood sample from the caudal vein of a carp.



Fig. 2a. Carp, 2 YO, ulcerous skin lesions – a hemorrhagic and necrotic erythrodermatitis. (Aeromonosis)

Fig. 2b. Carp, 2 YO, suspected of Aeromonas septiemia. Necropsy exam – the presence of a serohemorrhagic liquid in the abdomen.



Fig. 1. Silver carp, 3 YO, hemorrhagic lesions on the skin and fins. Bacterial septicemia caused by Aeromonas spp.

Fig. 2c. Carp, 2 YO, suspected of *Aeromonas septicemia*. Bacteriologic exam— cardiac puncture for blood sample collection for bacterial cultures.



Fig. 3a. Grass carp, 4 YO, massive gill infestation with *Sinergasillus* spp.

Fig. 3b. *Sinergasillus* spp. obtained from a gill scrape; examined with a stereoscopic microscope at a 40x magnification.



Fig. 4a. Silver carp, 4 YO, tail anatomic region with an intense skin invasion with *Lernaea* spp; ulcers with bacterial complications and a high amount of inflammatory exudate.

After having worked at the production and research fish station, I became an Assistant Lecturer at the Faculty of Veterinary Medicine and then joined a Ph.D. program. My thesis subject dealt with parasitic diseases of farmed fish. For eight years I studied the diagnosis of parasitic invasions and their effect on the tissues and organs of fish, particularly through histopathology. After I was granted my Ph.D., it became easier for me to access research contracts regarding fish pathology; two of these were the Precocious Diagnosis of Pathological Diseases in Farmed Fish and the Lesional and Epidemiologic Impact of Infectious Diseases on Farmed Fish.

Now, I am a faculty professor, and I teach Fish Pathology to students. Thanks to my current status, I now have the means to put an emphasis on the importance of studying diseases of aquatic animals and their connection to the health and nutritional safety of humans, the link of these conditions to water quality and the environment.

It is salutary for veterinarians to learn more about the health of aquatic animals and of course, their main diseases. It would be ideal if the graduate programs of various faculties would take place at fish farms, aquariums, and fish research facilities where students would be able to observe practical aspects regarding the life of these animals, how they are fed and kept, as well as details regarding their reproduction.

Included in this article are several images of pathological cases of farmed fishes in the northeastern area of Romania.

Dr. Vasile Vulpe
vasile_vulpe@yahoo.com
Faculty of Veterinary Medicine of Iasi
8, Mihail Sadoveanu Alley
700489, Iasi, Romania

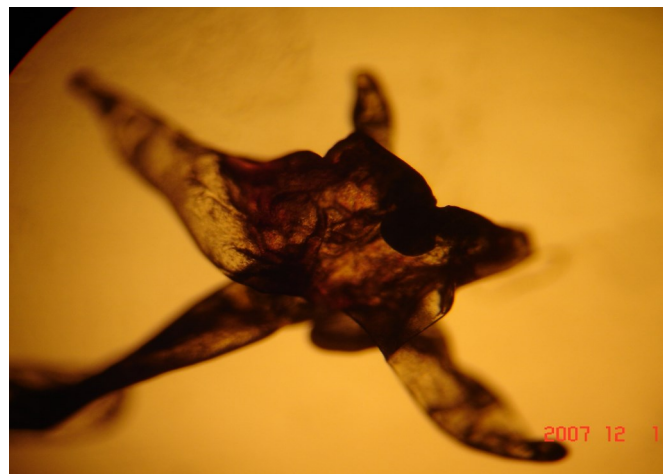


Fig. 4b *Lernaea* spp, cephalic region; stereoscopic microscope, 80x magnification.

Questions & Answers from the WAVMA Listserv
(WAVMA_Members-L@wavma.org)

Formalin Dips for Quarantined Fish

Dear WAVMA Members:

I have been revamping our aquarium quarantine protocol. Between days 0-3, depending on how the fish appear, we will do Fresh Water (FW) dips on saltwater species and we want to do formalin dips with FW species. Though my concern is that most of the FW species we acquire are warm FW species - cichlids. In Noga's book it states that Formalin is more toxic at high temperatures and also contraindicated in fish that have been recently stressed (e.g., transport). Based on this I don't see any reason to do Formalin dips in the FW fish that we acquire.

Though are there any who still perform formalin dips and what is your dose? The prior protocol I am revamping had a dose of 50 ppm for 2 hours and monitor DO. This appears to be a lower dose compared to the 60 minute treatment at 125-250 ppm in Noga's book, though it warns not to use when temperatures are higher than 70°F (we keep our FW fish at a low end of 80°F).

Based on this I don't see any reason to do a Formalin bath, though do feel that despite these warnings formalin dips are beneficial. Any suggestions or advice would be greatly appreciated thanks.

Robert Martinez, DVM

Aquatic Veterinary Consulting, PLLC
Blank Park Zoo

Dear Robert,

I use a 200 ppm bath for 60 minutes with coldwater species. They are mainly invasive species which our local government environmental services catch from rivers. First, I quarantine them for a month or longer and I give them praziquantel as soon as they start eating our diet. Before moving them to exhibition tanks, I do the formalin protocol. I haven't had much problems as long as the aeration is strong.

In the case of tropical species, I have had issues in the past with high mortalities in some species. As we get the species from known sources, I stopped using formalin in tropical fishes and I only use it on very few cases.

I hope this is helpful for you.

Yours faithfully,

Jose Barrio

Veterinarian/Aquaculture specialist

mvjbarrio@gmail.com

Hi Robert,

I routinely use formalin in tropical FW fish. I don't use the high concentration baths or dips, though. I do 25 ppm immersions and dose every other day for 3 doses. I then repeat in a week. I rarely see issues. I am cautious in scaleless fish. Make sure to provide additional airstones.

Michael Hyatt, DVM

Adventure Aquarium
Camden, NJ

Hello Robert

I've been using 25ppm formalin in FW tropical fishes as a long bath (up to 7 days) with water changes and top ups of formalin without issues. Tropical freshwater conditions.

With Kind regards

Fred Chua

Allpets and Aqualife Vets
24 Jalan Kelulut Singapore 809041
fredchua@allpetsasia.com

Hi Robert,

At PetSmart, we treat all our incoming fish with Formalin Solution at 25 ppm (mg/L). This level seems safe for all tropical fish, even scaleless ones. We keep our water at 73-75°F in the fish systems. Because formalin lowers the dissolved oxygen concentration in the water, it is important to have good circulation and aeration in the water.

Also, since formalin is a gill irritant, if the fish are already having gill damage from ammonia, chlorine or other irritants, care must be taken. However, we treat new shipments of fish on a weekly basis with formalin.

Nick Saint-Erne, DVM, CertAqV

nsainterne@petsmart.com



Formalin Solution Treatment

Ingredients:

Formaldehyde (HCHO) 37%
Water (H₂O) 51%
Methanol (HCOOH) 12%, to inhibit paraformaldehyde formation

Usage:

Formalin can be used with ornamental fish for the treatment of external protozoal parasites (*Chilodonella*, *Trichodina*, *Trichophyra*, *Ichthyobodo*, *Ambiphyra*, *Tetrahymena* and *Ichthyophthirius*). Do not confuse this 37% solution with the 10% Buffered Neutral Formalin used for tissue preservation.

Dosage:

Use one milliliter (1 ml) Formalin per 10 gallons of water to achieve a dosage of 25 PPM (mg/L) Formalin. This dose can be used as a long-term bath.

Treatment Procedures:

Pour appropriate amount of solution into pond or aquarium near a water inlet so that it quickly disperses. Continue to vigorously circulate the water to prevent oxygen level decrease, as 25 mg/L of Formalin may lower the dissolved oxygen in the water by as much as 5 mg/L. Repeat treatment every other day for a total of three applications. May need to repeat treatment after 1-2 weeks.

Caution:

If fish become stressed during treatment, make a partial or complete water change. Decrease dose by half in water above 70°F / 21°C. Do not use in water less than 40°F / 5°C. Always store solution at temperatures above 40°F / 5°C to prevent the formation of toxic paraformaldehyde, which appears as a white precipitate in Formalin solutions.

Safety Data:

Keep out of reach of children!
Avoid eye or skin contact. Avoid inhaling vapor. Harmful if inhaled or absorbed through skin. Wash thoroughly with soap and water after handling.

First Aid:

In case of contact, immediately flush eyes or skin with plenty of water. If inhaled, move to fresh air. If swallowed, give water then induce vomiting immediately and get prompt medical aid.

Above information extracted from *Advanced Koi Care* by Nicholas Saint-Erme, DVM; 2nd Edition (2010); p151.

Use of Formalin to Control Fish Parasites By Ruth Francis-Floyd

Formalin is used as a bath treatment to control external parasitic infections of fish. It is extremely effective against most protozoans, as well as some of the larger parasites such as monogenetic trematodes. Formalin effectively kills parasites on gills, skin, and fins. It is not the preferred treatment for external bacterial or fungal infections. In addition, high concentrations of formalin are used to control fungi on fish eggs. Formalin is not effective against internal infections of any type.

Formalin is applied as a bath treatment. It can be applied as a prolonged bath, which means it is placed into the water indefinitely, or it can be applied as a short-term bath, which means fish are placed into the bath for a relatively short period of time (30 to 60 minutes) and then placed into clean (untreated) water. The concentration of chemical used is determined by the period of time the fish are to be in contact with the chemical, the temperature of the water, and the condition of the fish. Extremely sick fish may not be able to tolerate a "full" treatment. Any time fish exhibit signs of distress (i.e., darting, gasping, or trying to jump out of the water) during a chemical treatment, they should be placed into clean (untreated) water at once.

The concentration of formalin appropriate for a prolonged bath is 15 to 25 mg/l. The lower concentration, 15 mg/l, would be appropriate for pond use, however, the use of formalin in ponds is discouraged for several reasons which are discussed below. The higher concentration, 25 mg/l, is easily applied to aquaria and tanks at 1 milliliter (ml) per 10 gallons, or 2 drops per gallon. Any time formalin is applied, vigorous aeration must be provided.

For short-term baths, a concentration of 250 mg/l, or 1 ml per gallon, can be delivered for 30 to 60 minutes. At moderate water temperatures (less than 70°F or 21°C), fish can be left in a 250 mg/l formalin bath for about one hour; however, if fish are weak or noticeably sick, the treatment should be discontinued after 30 minutes. Never exceed one hour of chemical exposure at this concentration. If fish show signs of distress before the allotted time has elapsed, they should be removed from the treatment immediately. At warmer water temperatures (greater than 70°F or 21°C) the concentration of formalin should be decreased to 150 mg/l for no more than one hour. Vigorous aeration must be provided to fish during treatment.

Excerpted from: VM-77, College of Veterinary Medicine, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Date published April 1996.

AQUATIC VETERINARY ABSTRACTS:**Marine Mammals**

Compiled by David Scarfe

Marine Mammal Zoonoses: A Review of Disease Manifestations

By T. B. Waltzek, G. Cortés-Hinojosa, J. F. X. Wellehan Jr., Gregory C. Gray

E-mail: tbwaltzek@epi.ufl.edu

Zoonoses and Public Health, 59: 521–535.

doi:10.1111/j.1863-2378.2012.01492.x

First published: 14 June 2012

Abstract

Marine mammals evoke strong public affection as well as considerable scientific interest. However, the resultant close contact with marine wildlife poses human health risks, including traumatic injury and zoonotic disease transmission. The majority of zoonotic marine mammal diseases result in localized skin infections in man that resolve spontaneously or with appropriate medical therapy. However, other marine mammal zoonoses, if left untreated, induce life-threatening systemic diseases that could pose public health risks.

As the number of zoonotic diseases rises, the diagnosis of and treatment for these emerging pathogens pose special challenges requiring the expertise of physicians, veterinarians and wildlife biologists. Here, we provide a comprehensive review of the bacterial, viral and fungal marine mammal zoonotic diseases that we hope will be utilized by public health professionals, physicians, veterinarians and wildlife biologists to better understand, diagnose and prevent marine mammal zoonotic diseases.

Comparative anatomy of the ophthalmic rete and its relationship to ocular blood flow in three species of marine mammal

By Hiroyoshi Ninomiya, Emi Imamura, Tomo Inomata

Vet Ophthalmol, 17: 100–105. doi:10.1111/vop.12048

First published: 7 June 2013

Abstract**Objective**

To examine the blood supply to the eyes of bottlenose dolphin (*Tursiops truncatus*), spotted seal (*Phoca largha*), and California sea lion (*Zalophus californianus*). Emphasis is placed on exploring the anatomic function in the context of aquatic life.

Procedure

Methyl methacrylate casts were prepared and studied using a scanning electron microscope. Infrared images of the eye were recorded using a thermocamera.

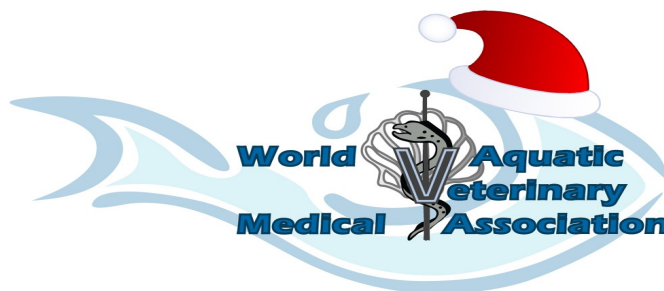
Results

In all three marine species, blood is supplied to the ophthalmic rete. The main source of blood supply to the rete is the basilar rete via the spinal rete in the dolphin and via the ophthalmic artery in the seal and sea lion. The retinal and choroidal arteries are derived from the rete. The dolphin rete showed a very well-developed arterial network occupying most of the orbit. The rete in pinnipeds was less developed with several entwining arteries, unlike that in cetaceans. Thermographic examination revealed that the eye shows a higher degree of thermal emission than adjacent areas of the skin in these 3 species.

Discussion

The role of the rete in aquatic mammals appears to conserve ocular temperature so that the appropriate operating temperature for photoreceptors and ocular muscles can be maintained in a cold ambient temperature. Additionally, the rete might have a flow-damping effect by maintaining resistance to blood flow in the orbit. This study highlights the special nature of ocular vascular anatomy and function that enabled the unique adaptation of aquatic mammals to life in aquatic habitats.

The Aquatic Veterinarian is meant to be read as a 2-page spread (like a paper magazine!). To view it this way on your computer, open the pdf document using Adobe Acrobat or Adobe Reader, then go to the menu bar at the top of the computer screen and click on View, then Page Display, then Two Page View. That will allow you to scroll thorough the issue seeing the cover page by itself first, followed by two pages side by side for the rest of the issue. Doing this, you will be able to see the Centerfold picture in all its ginormous glory!



Know The Marine Mammals

Marine mammals comprise over 130 living and recently extinct species in three taxonomic orders. The [Society for Marine Mammalogy](#), an international scientific society, maintains a list of valid species and subspecies, most recently updated in October 2015.

Marine mammal adaptation to an aquatic lifestyle varies considerably between species. Both cetaceans and sirenians are fully aquatic and therefore are obligate water dwellers. Seals and sea-lions are semiaquatic; they spend the majority of their time in the water, but need to return to land for important activities such as mating, breeding and molting. In contrast, both otters and the polar bear are much less adapted to aquatic living.

Phylogeny of marine mammals

Order [Cetartiodactyla](#)

Suborder [Whippomorpha](#)

Family [Balaenidae](#) ([right](#) and [bowhead](#) whales), two genera and four species

Family [Cetotheriidae](#) (pygmy right whale), one species

Family [Balaenopteridae](#) (rorquals), two genera and eight species

Family [Eschrichtiidae](#) ([gray whale](#)), one species

Family [Physeteridae](#) ([sperm whale](#)), one species

Family [Kogiidae](#) ([pygmy](#) and [dwarf](#) sperm whales), one genus and two species

Family [Monodontidae](#) ([narwhal](#) and [beluga](#)), two genera and two species

Family [Ziphiidae](#) (beaked whales), six genera and 21 species

Family [Delphinidae](#) (oceanic dolphins), 17 genera and 38 species

Family [Phocoenidae](#) (porpoises), two genera and seven species

Order [Sirenia](#) (sea cows)

Family [Trichechidae](#) (manatees), two species

Family [Dugongidae](#) ([dugongs](#)), one species

Order [Carnivora](#) (carnivores)

Suborder [Caniformia](#)

Family [Mustelidae](#), three species

Family [Ursidae](#) (bears), one species

Suborder [Pinnipedia](#) (sealions, walruses, seals)

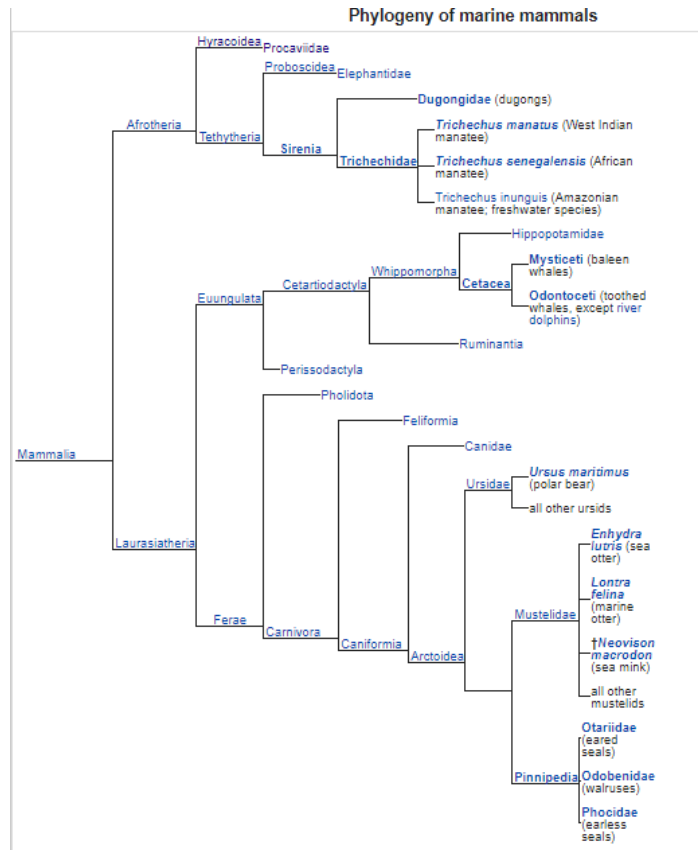
Family [Otariidae](#) (eared seals), seven genera and 15 species

Family [Odobenidae](#) ([walrus](#)), one species

Family [Phocidae](#) (earless seals), 14 genera and 18 species

Information from:

https://en.wikipedia.org/wiki/Marine_mammal



A [humpback whale](#) (*Megaptera novaeangliae*), a member of infraorder [Cetacea](#) of the order [Cetartiodactyla](#)

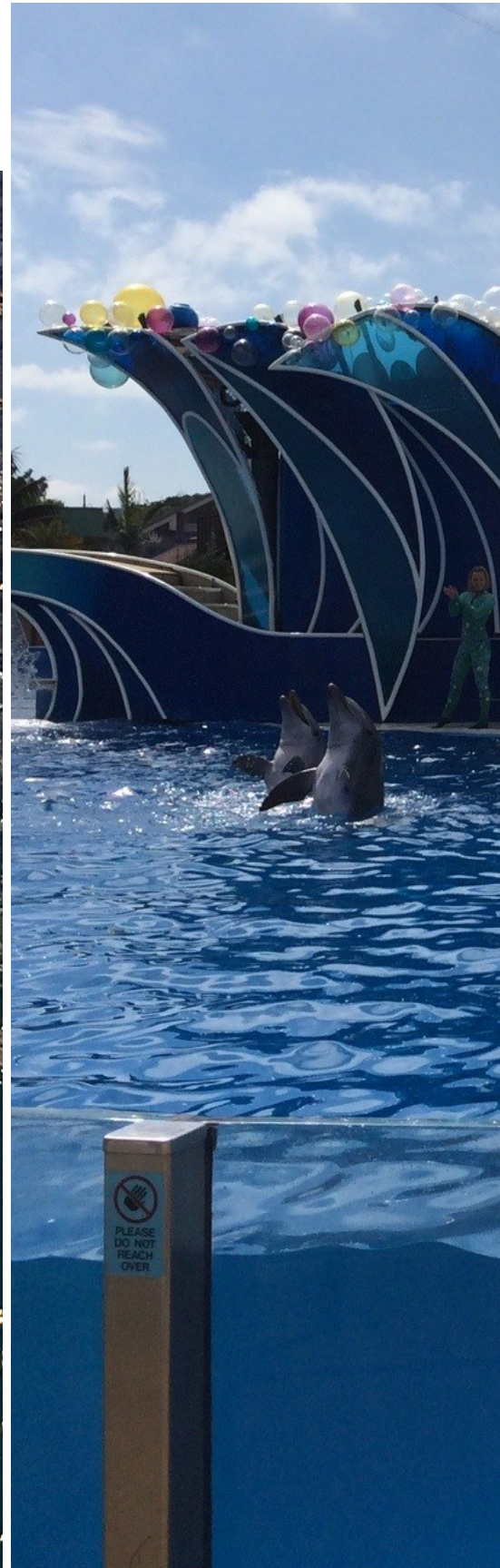


A [West Indian manatee](#) (*Trichechus manatus*), a member of the order [Sirenia](#)

Right: Dolphins at Sea World, San Diego, California.

Below: Beluga whale at the Shedd Aquarium, Chicago, Illinois.

Photos by Nick Saint-Erne, DVM CertAqV





Researchers Probing the Beneficial Secrets in Dolphins' Proteins

by Medical University of South Carolina
10/14/2016

Dolphins may help researchers find a way to protect humans' kidneys during a heart attack, stroke or acute kidney injury. Dolphins seem to have protective proteins that may contain clues to treatments for aging-associated diseases in humans. A study published in Nature's *Scientific Reports* September 26, 2016 issue found dolphin serum contains very high levels of an antioxidant protein.

Michael Janech, director of Medical University of South Carolina's Nephrology Proteomics Laboratory, said he was surprised by the finding and excited about how this might be used in future studies to help humans. Dolphins survive dives that deprive vital organs of oxygen without causing damage and that for humans would be lethal. During dives that can last as long as 90 minutes, marine mammals restrict blood flow to their kidneys, liver, heart and lungs to shunt more oxygen to the brain.

When marine mammals resurface, oxygenated blood flow is restored to those organs without the organs suffering damage. In humans, though, the same phenomenon of hypoxia or being deprived of oxygen followed by re-oxygenation, such as experienced during heart attack, stroke and acute kidney injury, causes the release of free radicals thought to damage human organs. Janech, a kidney researcher and expert in proteomics, was curious what gives dolphins this advantage.

Proteomics is the study of all proteins that are encoded by the genes, he said. "We attempt to analyze all the proteins at once rather than individual proteins at one time in a cell or a tissue or an organism. It's just like genomics - when people are looking at 20,000 genes and seeing if they are high or low in certain disease states. We're doing the same thing with certain proteins."

Because the diversity of proteins is so large, researchers usually require mass spectrometers that perform at high resolution, allowing investigators to accurately determine the identity of proteins and other molecules of interest. This expertise came in handy in how the current study came about.

While Janech was working with the Marine Mammal Center in Sausalito, California, and the National Marine Mammal Foundation in San Diego, California, to identify biomarkers in sea lions affected by toxic algae blooms on the west coast, he learned that some of the managed dolphins in the U.S. Navy Marine Mammal program were living much longer than wild ones. They were developing insulin resistance and fatty liver disease as they aged, a process consistent with the



Photo credit: MUSC

development of metabolic syndrome in people. This observation presented a rare opportunity.

"That's not a model that anybody sees in nature, because dolphins usually don't get this old in nature," said Janech.

Janech joined forces with Stephanie Venn-Watson, director of the National Marine Mammal Foundation's Translational Medicine Research Program in San Diego, and Randall Wells, director of the Chicago Zoological Society's Sarasota Dolphin Research Program in Florida. Venn-Watson is a veterinary expert of the Navy's managed dolphin populations, while Wells is an internationally respected expert of wild dolphin biology.

Together the group is attempting to determine the cause for insulin resistance in managed dolphins, and then use knowledge of human and dolphin similarities to find clues for treating the condition in both species. With funding provided by the Office of Naval Research, the Janech laboratory began to track adiponectin in the serum of the managed and wild bottlenose dolphin populations. Levels of adiponectin, an insulin-sensitizing hormone, were predicted to be different in managed dolphins with metabolic syndrome in comparison with those in the wild. In order to verify the relevance of their work to human metabolic syndrome, they also performed simple proteomic analyses in human and dolphin serum samples.

Given that the major proteins in mammals are constant across species, they expected the highest concentration of proteins to be similar in both species. What they found when they looked just below the threshold, however, was surprising, he said.

Eleven proteins were at least 100-fold more prevalent in dolphin serum than in humans. At first, the group wrote this off as a difference in genetic ancestry: at some phylogenetic branch in the evolutionary tree of development, some mammals branched off and developed into two-toed ungulates and some went on to

become primates. Bottlenose dolphins are mammals descended from even-toed ungulates such as pigs, deer, and giraffes. To check that this was the case, they also mapped the serum proteome of the pig, and were again surprised. The 100-fold rank differences in 5 of the proteins, including vanin-1 and adiponectin, could not be explained away by simple phylogenetic differences.

While adiponectin is known to be higher in dolphins, as a way to control glucose storage during feeding, very high vanin-1 was a novel finding. Interestingly, excessively high vanin-1 levels were correlated with decreased liver function in the wild dolphins, which suggests they provide a protective effect in avoiding metabolic syndrome. But Janech, Venn-Watson, and Wells also noticed another potential need for vanin-1. The function of vanin-1 is to make vitamin B5 and in doing so it releases an antioxidant that has been shown to protect tissues from injury like that which occurs after the hypoxia and re-oxygenation of diving and resurfacing.

The question is if this could work also to help humans resist the hypoxia that causes acute kidney injury, which Janech has applied for a grant to the National Science Foundation to study. He and colleagues are gathering samples from a number of different diving and non-diving marine mammals, and land-bound mammals, and mapping their proteomes as well. They have continued their current collaboration, and also included graduate students from the College of Charleston's Grice Marine Laboratory and investigators from the National Institutes of Standards and Technology at Hollings Marine Laboratory to help with their measurements.

Janech said there's much to learn from the field of biomimicry, especially paired with proteomics.

"Proteins are the workhorses of the genes. It is how the gene provides function to the cell. The action of the cell happens through the proteins. That's why we want to study the proteins. These are your enzymes," he said.

"This is the first step. We wanted to ask what's different in an animal that can do something that would hurt a human, and they do this every single day. And can we take it back to human medicine?"

For full article, See:

<https://www.laboratoryequipment.com/news/2016/10/researchers-probing-beneficial-secrets-dolphins-proteins>

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TAVeditor@wavma.org.

Action cams give the low down on dolphins

By David Szondy

February 21st, 2017

People have been fascinated by dolphins for millennia, but we still know very little about their life in the wild. Now a team of scientists from the University of Sydney's Charles Perkins Centre and the University of Alaska Southeast have lifted the veil on cetacean private life thanks to new cameras that harmlessly attach to the animal's flank and provide an account of dolphin behavior that more invasive techniques have missed.

According to Heidi Pearson, Assistant Professor of Marine Biology at the University of Alaska Southeast, we can see only 10 percent of dolphin behavior from the surface and sending down dive teams and submersibles to study and film them may bring back valuable data, but it also interferes with their behavior. The team's solution was to use special camera modules equipped with suction cups that attach to the dorsal flanks of dolphins. Each camera is equipped with a six-hour battery, memory boards, VHF and satellite transmitters, and time/depth recorders.

Tests involving eight wild dusky dolphins were carried out off the coast of New Zealand from December 2015 to January 2016. So far, the cameras have provided scientists with 535 minutes of video showing rarely-witnessed behaviors, such as mother-calf interaction, playing with kelp, and social flipper-rubbing, as well as hunting and other habits

By studying dolphins so intimately, it will be possible to gain a better understanding of the marine environment as well as the stocks of fish and squid eaten by dolphins. In addition, it will be a way to help minimize the impact of human activities, like shipping, on dolphin wellbeing as well as monitoring aquatic endangered species with high resolution.

"For the first time, these cameras have given us the opportunity to see what dolphins do on their own terms," says Dr Gabriel Machovsky-Capuska from the University of Sydney's School of Veterinary Science and Charles Perkins Centre. "There were no wildlife crews, no invasive underwater housings – and the dolphins remained largely unaffected by our cameras. This research opens up a whole new approach for capturing wild animal behavior, which will ultimately help us to not only advance conservation efforts but also come closer to understanding wild predators' and human nutrition too."

Now that the technology has proven itself on dolphins, the team hopes to adapt it to other cetacea and to sharks.

The results were published in *Marine Biology*.

Source: [University of Sydney](http://www.universityofsydney.edu.au/news/2017/02/action-cam-dolphins/)

<http://newatlas.com/action-cam-dolphins/48037/>

Porpoises plan their dives and can set their heart rate to match

By Andy Coghlan
21 November 2016
[Daily news](#)

Two captive harbour porpoises called Freja and Sif have helped to reveal that porpoises — and probably all cetaceans — consciously adjust their heart rate to suit the length of a planned dive. By doing this, the animals optimise the rate at which they consume oxygen beforehand to match the intended depth and length of their dive.

“Until now, we knew that the heart rates of porpoises and cetaceans in general correlate with different dive factors, such as dive duration, depth and exercise,” says Siri Elmegaard of Aarhus University in Denmark, who led the research. “Now we can conclude that harbour porpoises have cognitive control of their heart rate.”

Researchers discovered as far back as 1975 that pinnipeds — such as sea lions — had the ability to consciously control their heart rate.

“What is remarkable is that it has taken four decades since the pioneering work on the cognitive control of heart rate in sea lions for researchers to ask the same question for cetaceans,” says Terrie Williams of the University of California, Santa Cruz. “This latest discovery is indeed an exciting advance in our understanding of the dive response in whales and dolphins.”

Elmegaard and her colleagues discovered the cognitive control phenomenon after fitting Freja and Sif with equipment to measure their heart rates for the first 15 seconds of dives at the Fjord & Bælt centre in Kerteminde, Denmark. They taught the pair to perform dives that lasted either 20 or 80 seconds, then familiarised them with a sound cue associated only with the 20-second dives.

“We saw that the porpoises didn’t lower their heart rates as much during the initial 15 seconds of a 20-second dive as they did during an 80-second dive,” says Elmegaard.

On average, Freja’s and Sif’s heart rates were 15 and 26 per cent lower when they performed the longer dives, compared with shorter ones, suggesting that this would help them optimise oxygen use while swimming down. Importantly, these differences occurred in response to a mental cue — the sound that distinguished the shorter and longer dives — demonstrating that they were premeditated. “We concluded that the porpoises have cognitive control of their heart rate by adjusting their dive response in anticipation of the dive duration,” says Elmegaard.

<https://www.newscientist.com/article/2113451-porpoises-plan-their-dives-and-can-set-their-heart-rate-to-match/>

15 endangered right whales have been found dead off the East Coast of Canada and the U.S. this year

By David Burke,
Oct 05, 2017
[CBC News](#)

Necropsies on seven North Atlantic right whales found dead in the Gulf of St. Lawrence this summer showed that four died of blunt force trauma from collisions with ships, while two appeared to die after being entangled in fishing gear. The cause of death for one whale was inconclusive.

Pierre-Yves Daoust, a pathologist and professor at the Atlantic Veterinary College (AVC), and Émilie L. Couture, a veterinarian with the Zoo de Granby and the Université de Montréal, made their findings public at the Atlantic Veterinary College this morning. Both are part of the Canadian Wildlife Health Cooperative.

Daoust said it was very challenging to determine exactly how the whales died because they decompose so quickly. Even determining that the whales were killed by blunt force trauma caused by ships was difficult, he said. The thick blubber and muscle on a right whale makes it hard to detect the injuries; only by examining damage to the whales’ organs was the team able to conclude that a blunt force was responsible.

“Because of the major impact there can be shearing of some of the internal organs like liver, like heart, major blood vessels, which causes severe internal hemorrhaging, which is what we saw,” said Daoust.

It’s likely most of these whales died in different areas and weren’t part of the same pod. Out of the seven whales that were examined, five were males and two were females. The entire right whale population is estimated to only consist of about 500 members, so any early deaths have a big impact on the species.

“The fact remains that human activities are a very important cause of this mortality this summer,” said Daoust.

All those deaths led Transport Canada to introduce a mandatory 10-knot speed limit for large vessels in the Gulf to try and cut down on the number of whale deaths. Transport Canada now says it will look at removing that slow-down zone once the right whales begin to migrate south.

“We’re shifting focus towards what we can do as next steps, how we can go about preventing future mortalities going forward and those discussions are going to be taking place over the coming months,” said Matthew Hardy, a division manager with the Department of Fisheries and Oceans Canada.

For full article, see:

<http://www.cbc.ca/news/canada/prince-edward-island/pei-right-whale-necropsy-report-1.4331034>

A surge in strandings of dolphins, other marine mammals on Cape Cod

By Morgan Winsor
Mar 6, 2017

Seven dolphins, two pregnant, that were rescued from the mudflats of a river on Cape Cod are among the most recent marine mammals that were found stranded in the area. The hook-shaped Cape Cod, which juts out about 70 miles into the Atlantic Ocean, is one of only a few places in the world where mass strandings — two or more whales, dolphins or porpoises getting beached at the same time — occur regularly, according to the International Fund for Animal Welfare, which regularly responds to strandings on Cape Cod.

The seven dolphins found stuck in the mudflats in Wellfleet, Massachusetts, were freed by more than a dozen rescuers from the group, with the help of Wellfleet town staffers, Kerry Branon, a spokeswoman for the IFAW told ABC News in an email.

An examination by a veterinarian and experts at the site found the dolphins to be healthy. "Ultrasound exams showed that two of the females were pregnant," Branon said. The seven dolphins were taken by trailers to another beach, "where they were successfully released."

"Cape Cod is a global hot spot for dolphin mass strandings," Brian Sharp, a manager at the IFAW, wrote in a March 1 press release. "Unlike strandings in recent years, these recent events appear to be somewhat different."

"One significant difference is that these dolphins are primarily females with calves, versus the norm over the last decade of a high proportion of young males. These females and calves seem to be exhibiting higher levels of stress and shock, and many are not surviving the initial physical impacts of the strandings like dolphins have in previous years," he wrote.

Sharp added, "Due to the high number of stranded animals, our team of experts is investigating each event and hopes to know more once results from clinical test are received."

Earlier last week, two dolphins — a mother and calf — were found in a shallow creek on Cape Cod, and five more dolphins were discovered later in the day, he wrote. The mother and calf were treated for shock and transported for release. Three of the other five dolphins died shortly after their stranding, but the remaining two were released.

That was just one day of a busy week for the IFAW's marine mammal rescue and research team, which Sharp heads. In one week beginning Feb. 22, 2017 it responded to seven strandings of dolphins and harbor porpoises, saving 20 animals.



The International Fund for Animal Welfare's Marine Mammal Rescue and Research Team rescued seven dolphins stuck on the mudflats of the Herring River in Wellfleet, Mass., March 3, 2017.

Marine mammal strandings are generally attributed to a variety of causes. Many species of whales and dolphins are highly social animals that, like humans, depend on the group to survive, according to an IFAW fact sheet.

Marine mammals may become stranded when they swim too close to shore to pursue prey or avoid predators like sharks. Extreme weather can also play a role.

Some scientists and conservation groups say climate change and its effect on sea temperatures and the frequency of extreme weather events pose a severe threat to marine mammals. Whale and Dolphin Conservation, a U.K.-based wildlife charity, says climate change may be one of the biggest threats facing whales and dolphins today.

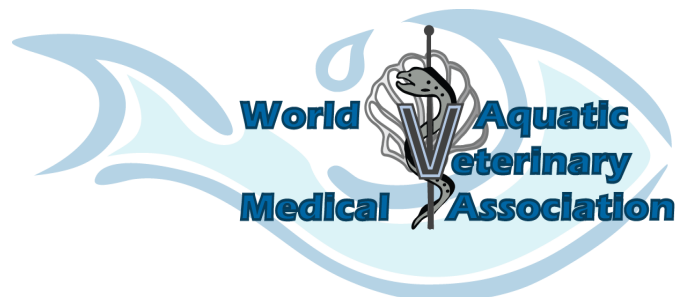
For full article, see:

<http://abcnews.go.com/US/surge-strandings-dolphins-marine-mammals-cape-cod/story?id=45908105>

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TAEditor@wavma.org.



Florida survey spots record number of manatees

By Phil Gast, Emanuella Grinberg and John Couwels
February 22, 2017
CNN

There's some good news out of Florida: For the third straight year, spotters counted more than 6,000 manatees navigating Florida's waters. An aerial survey ending in February 2017 had a preliminary total of 6,620 creatures, compared to 6,250 in 2016 and 6,063 the year before. That's a far cry from the estimated 1,267 manatees seen in 1991.

"The relatively high counts we have seen for the past three years underscore the importance of warm water habitat to manatees in Florida," said Gil McRae, head of the state's Fish and Wildlife Research Institute. The survey counted 3,488 of the lovable sea cows on the state's east coast and 3,132 along the west coast.

The [Save the Manatee Club](#) says at least 98 manatees were killed by watercraft in 2016. The organization also has cited the vulnerability of the animals to cold weather and red tide, a harmful algal bloom.

"The threat is still out there, and it's not going away," Katie Tripp, director of science and conservation for the club, said last year. "You don't celebrate when you're not done with the game. There's a lot more work to be done to safeguard the habitat, to get manatees removed from the Endangered Species Act altogether."

The Act defines an [endangered species](#) as one currently in danger of extinction throughout all or a significant portion of its range. The designation came with federal restrictions on such things as boat speed and waterfront development that are credited with protecting the species and reversing its decline. A threatened species is one that is likely to become endangered within the foreseeable future.

The manatee remains protected in the United States under the Marine Mammal Protection Act. The US Fish and Wildlife Service early last year proposed making the change to a less serious status because of "significant improvements" in the manatee population and habitat conditions. The West Indian manatee includes the Florida manatee.

"The manatee's recovery is incredibly encouraging and a great testament to the conservation actions of many," Cindy Dohner, the Southeast regional director for US Fish and Wildlife, said. "Today's proposal is not only about recognizing this progress, but it's also about recommitting ourselves to ensuring the manatee's long-term success and recovery."

See full story:

<http://edition.cnn.com/2017/02/20/us/florida-manatee-count-endangered-species/>

Florida's manatees will be around for at least another century

By Brooks Hays (UPI)
April 13, 2017



Photo
by
USGS

Researchers with the U.S. Geological Survey and the Florida Fish and Wildlife Research Institute assessed the health and longevity of Florida's manatee population in a [new study](#). According to a team of manatee experts, Florida's iconic sea mammals are certain to persist for another 100 years.

"Today the Florida manatees' numbers are high," Michael C. Runge, a research ecologist with USGS, said. "Adult manatees' longevity is good, and the state has available habitat to support a population that is continuing to grow."

"Still, new threats could emerge, or existing threats could interact in unexpected ways," Runge said. "Managers need to remain vigilant to keep manatee populations viable over the long haul."

At latest count, conducted earlier this year, Florida was home to 6,620 manatees. The sea cow's comeback inspired the Interior Department to [upgrade the species status](#) from endangered to threatened earlier this year.

Researchers expect the population to double and slowly shift northward over the next 50 years. But challenges will remain. Currently, the species main threats are water craft collisions and lack of warm water refuges. In the coming decades, scientists expect red tides, a type of toxic algae bloom, to become a greater threat.

But scientists determined that only a drastic rise in the rate of manatee-boat collisions would jeopardize the species' continued recovery.

"Manatee populations will continue to face threats," Runge said. "But if these threats continue to be managed effectively, manatees will be an integral and iconic part of Florida's coastal ecosystems through the coming century."

See full article:

http://www.upi.com/Science_News/2017/04/13/Floridas-manatees-will-be-around-for-at-least-another-century-scientists-project/9231492092193/

SeaWorld Orlando welcomes its first baby walrus

By Dewayne Bevil
Orlando Sentinel

The first baby walrus in SeaWorld Orlando's history was born at the theme park in June. The newest momma in the park is a 14-year-old walrus named Kaboodle and the father is named Garfield. She gave birth to her first calf, named Ginger, in the wee hours of June 3, 2017. The pair are now bonding backstage, and they cannot yet be observed by SeaWorld Orlando visitors.

The park's animal husbandry and veterinary teams provided pre-natal care and regular ultrasounds for the expectant mother, and Kaboodle and her new calf remain under the 24-hour care of the teams. Walruses, along with beluga whales, typically can be seen in the Wild Arctic habitat of the theme park. That experience is included in regular SeaWorld Orlando admission.

Walrus calves are born with whiskers that are used to detect shellfish, a part of their diet. Both males and females have large tusks used for defense, for cutting through ice and for getting out of the water.

In the real world, walruses face habitat challenges from a thinning ice pack and warming temperatures, SeaWorld says. The SeaWorld Busch Gardens Conservation Fund has provided research assistance on the Pacific walrus. The company has cared for orphaned walruses with the permission of the U.S. Fish and Wildlife Service.

For full article, see:

<http://www.orlandosentinel.com/travel/attractions/theme-park-rangers-blog/>



Ginger being fed by Seaworld staff member.

Photo from:

<https://seaworld.com/orlando/>

Sea otter count looks good despite toll from sharks

By Lindsey Holden
September 29, 2017
The Tribune | SanLuisObispo.com

California's once prosperous sea otter population was decimated by the fur trade in the early 1800s. For nearly a century, the animal was believed to have been hunted to extinction in California until a small surviving colony was discovered in central Big Sur in the 1930s. Since then, the otters have returned to the coast, although they're still listed as a threatened species.

Although California's sea otter population continues to stabilize, sharks are still taking a toll on the furry marine mammals living on the Central Coast. The U.S. Geological Survey released the results of its annual southern sea otter survey, which reported the three-year average at 3,186 animals. This year's count is down 3 percent from 2016, when the three-year average was 3,272 otters.

Even so, the count exceeded 3,090, the number needed to remove the otters' threatened designation. The population must exceed that number for another year before it will be taken off the list.

The otter population in the central region — starting at Seaside, near Monterey, and ending in Cayucos — has increased, according to a USGS chart. The number of otters in the north, from Pigeon Point to Seaside, has declined. The number of otters in the south region — which stretches from Cayucos down to Gaviota and encompasses most of San Luis Obispo County — has also gone down.

The otter decline in those areas is due to an increase in shark bite-related deaths, according to Tim Tinker, a USGS research ecologist. Tinker said the population now is the lowest seen since 2002 and 2003. The shark population in Southern California has grown since tighter fishing regulations were put in place, causing them to travel north to feed on sea lions and elephant seals, Tinker said. Sharks don't eat otters but may bite them when hunting because they resemble juvenile versions of their prey.

A study Tinker helped write for Marine Mammal Science in 2015 said more than 50 percent of sea otter carcasses found along the California coast were killed by sharks. The burgeoning shark population is healthy, but otters haven't increased the range of their colonies up and down the coast, he said: "Hopefully, over time, that will happen."

In spite of the sharks, there are still more otters in Morro Bay now than there were in the early 2000s, according to a May survey the state Department of Fish and Wildlife conducted.

For full article, see:

<http://www.sanluisobispo.com/news/local/environment/article176252506.html>

Girl treated to prevent *Mycoplasma* infection after sea lion encounter

By Gillian Mohney and Dr. Crystal Tan
May 24, 2017

A girl in Canada who was pulled into a harbor by a sea lion is receiving medical treatment over concerns her broken skin could have been infected by dangerous bacteria from the animal's mouth, according to officials at the Vancouver Aquarium.

A video that has gone viral showed a sea lion grabbing the young girl's dress and pulling her into the water. The girl, along with a man who jumped in to help her, were quickly pulled to safety. But marine life experts warned they could be at risk of getting a rare infection sometimes called seal finger.

The family contacted the Vancouver Aquarium for help, after one of the facility's mammal trainers spoke about the condition during several interviews over the weekend, according to aquarium spokeswoman Deana Lancaster.

"The family saw the media reports and got in touch with us. She did get a superficial wound, and she's going to get the right treatment," Lancaster told ABC News.

Seal finger infections are caused by different kinds of *Mycoplasma* bacteria, which live in the mouths of sea mammals like seals and sea lions, according to a 2009 published case report. Exposure via a cut in the skin can often result in cellulitis, or soft-tissue infection, and untreated severe infections can lead to loss of fingers or limbs.

"If any member of our animal care team receives a bite from a seal or sea lion, they take a letter from our vet with them to the hospital, which explains that the infection is resistant to some antibiotics," Lancaster told ABC News, adding that the condition can be "painful and potentially debilitating."

The infection, also called 'spekk finger' (from "blubber" in Norwegian), can be tricky to treat. *Mycoplasma* bacteria are the smallest form of bacteria and do not have a cell wall, which is the primary target for many antibiotics, like penicillin.

Other types of antibiotics, including tetracycline, can be used to treat the infection if it is diagnosed properly. Before antibiotics, many seal hunters risked losing fingers or hands to the disease.

For full article, see:

<http://abcnews.go.com/Health/girl-pulled-harbor-sea-lion-treated-rare-seal/story?id=47608594>

Crocodiles and dolphins evolved similar skulls to catch the same prey

March 8, 2017

Source: Monash University

A new study involving biologists from Monash University Australia has found that despite their very different ancestors, dolphins and crocodiles evolved similarly-shaped skulls to feed on similar prey. Dolphins and crocodiles now live in rivers and oceans, but each evolved from land-based animals. Feeding in water has many new challenges. This new study shows that despite being separated by 300 million years, dolphins and crocodiles found comparable solutions to these problems, and evolved skull shapes that are remarkably similar.

"Our results suggest the remarkable similarity between some crocodilians and toothed whales is driven by what they eat rather than where they live," said lead author Matthew McCurry from the Monash School of Biological Sciences.

Previously, no rigorous attempt had been made to show how similar the head shapes of dolphins and crocodiles really are. It had been thought that aspects such shallow seas or rivers contributed to the similarity of the skulls of crocodilians (crocodiles and alligators) and toothed whales (dolphins, orca and relatives). But a study published in Proceedings of the Royal Society B: Biological Sciences has debunked this long-held view. Having a long, thin snout must have great advantages when trying to catch small fish, both for crocodilians and toothed whales.

"What is really important about this study is that it will help us predict the diet of extinct aquatic mammals and reptiles just from the shape of their skulls," said Mr McCurry.

The authors used medical CT and laser 3D scanning to digitally capture the skulls of museum specimens from around the world. Once digitised, the authors could examine the shape of the skulls in detail without having them in one location. Using sophisticated mathematical techniques to analyse 3D shape, the researchers could show how diet, habitat and prey size correlated with skull shape.

"Crocodiles and dolphins seem so different to us, but our study shows that many of them are in fact remarkably similar, and this is really down to how they catch their food," said study co-author Associate Professor Alistair Evans, also from the Monash School of Biological Sciences.

Future research will aim to uncover why specific skull shapes are better at catching certain prey using bioengineering computer simulations.

Story Source:

[Materials](#) provided by [Monash University](#).

Bizarre Toothless Dwarf Dolphins Once Sucked Squid Off the Ancient Seafloor

By George Dvorsky
8/22/17

Scientists have uncovered the fossilized remains of an unusual species of dolphin that lived 30 million years ago in what is now South Carolina. These extinct aquatic mammals measured just three feet in length, they featured short snouts, and perhaps strangest of all, they had no teeth. As described in *Proceedings of the Royal Society B*, this newly discovered creature represents both a new species and an entirely new genus. Its name, *Inermorostrum xenops*, means “defenseless snout”—a reference to its toothless constitution.

The lead author of the new study, Robert W. Boessenecker from the College of Charleston, says this animal belongs to the *Xenorophidae* family—an ancient group of echolocating dolphins that represent the earliest evolutionary offshoot from toothed whales. As the discovery of *Inermorostrum* suggests, an interesting set of evolutionary experiments led this aquatic mammal down a very strange path.

Boessenecker’s analysis was based on the discovery of a single *Inermorostrum* skull, which was recently found in a limestone outcrop by a diver in South Carolina’s Wando River. Like other *Xenorophids*, its facial features suggest it had the ability to echolocate, but that’s where the similarities end. *Inermorostrum* had a tiny body, a snout about three times shorter, and a mouth completely devoid of teeth (other *Xenorophids* had a complete dental profile, featuring at least 11 teeth in its upper jaw). Clearly, this ancient dolphin had followed a different evolutionary path—but to what end?

Modern dolphins, with their long toothy snouts, are good at catching fish, but as Boessenecker points out, short snouts, which typically appear in toothed whales, are good for suction feeding.

“The smaller the oral opening, the greater the suction—pilot whales, belugas, and porpoises all have similarly short snouts and large, muscular lips,” explained Boessenecker. “The last feature is perhaps the most critical—toothlessness, or tooth reduction—as in suction feeding specialists like the narwhal (the tusk is the only tooth, and it is not used for feeding), sperm whales (which lack upper teeth), and beaked whales (which typically only have small tusks, also not used for feeding).”

Interestingly, *Inermorostrum* appeared just four million years after the emergence of its toothed whale ancestor, which suggests this echolocating species evolved its suction-feeding characteristics quickly.

<https://gizmodo.com/bizarre-toothless-dwarf-dolphins-once-sucked-squid-off-1798313881>

2018 AQUAVET® I & II & III

The College of Veterinary Medicine at Cornell University is pleased to announce the 2018 AQUAVET® I, II & III course offerings. They are aquatic veterinary medicine education programs that currently consist of two courses that will be presented at Roger Williams University in Bristol, RI in June 2018 and one on aquarium medicine held in three venues.

AQUAVET® I: An Introduction to Aquatic Veterinary Medicine is a 4-week course (27 May - 23 June 2018) intended primarily for veterinary students.

AQUAVET® II: Comparative Pathology of Aquatic Animals is a 2-week course (27 May - 9 June 2018) that is oriented toward the pathology of diseases of aquatic invertebrates and fish that are used in biomedical research, encountered in display aquaria and are of importance in commercial aquaculture.

AQUAVET® Summer Research Fellow (one offered) is an 8-week research program, usually studying fish disease at a lab at Cornell University. There is no tuition and this student will receive a stipend of \$3,800 after completing the 8 weeks.

AQUAVET® III: Clinical Aspects of Captive Aquatic Animal Medicine is a 5-week course (following AQUAVET® I – 24 June to 29 July 2018) and is limited to a small number of students. The venues include GA Aquarium, U of GA and Dolphinaris, Cancún, México.

Veterinary students can receive credits for the courses and graduate veterinarians can receive CE credits.

More detailed information and applications for admission (due by January 15, 2018) are available on the web site www.aquavet.org.

Donald W. Stremme, V.M.D.
AQUAVET® Director
Cornell University
College of Veterinary Medicine
Microbiology and Immunology
C5181 Vet Medical Center
Ithaca, NY 14853

www.aquavet.org
aquavetmail@gmail.com

Hong Kong City University, College of Veterinary Medicine and Life Sciences Aquatic Veterinary Medicine Programmes
By David Scarfe and Howie Wong

As the fastest growing sector of food production, aquaculture is now worth over 100 Billion US Dollars and exceeding all wild-capture fisheries, with China contributing over 60% of the entire world's supply. With diseases continuing to plague these industries, it is crucial that more efforts are in place to ensure that sufficient seafood is available for the world during the next century. Furthermore, aquaculture has not always taken its environmental responsibility seriously, and it has resulted in much habitat degradation, as well as the irresponsible use of veterinary chemicals and drugs causing food safety concerns. The need for a coordinated effort to revitalize an aquatic veterinary workforce in China is therefore imperative.

Until 2014, Hong Kong had no veterinary school, and has been reliant on veterinarians who have qualified overseas for its veterinary services. However, for the past decade, City University of Hong Kong's College of Veterinary Medicine and Life Sciences and Cornell University's College of Veterinary Medicine have collaborated on a project aimed at establishing a locally based veterinary college, with the curriculum modelled on Cornell's innovative and highly integrated delivery approach to veterinary education that focuses on problem-based learning. This provided the opportunity to develop courses to fulfil the team's vision to be the premier provider of comprehensive, evidence-based veterinary training, research and service in Asia, with particular emphasis on emerging infectious diseases, food safety, animal welfare and aquatic production.

This emphasis on aquatic veterinary medicine is evident in Hong Kong City University's new Bachelor of Veterinary Medicine programme, which brought in its first cohort in September 2017. The curriculum will cover the aquatic industry, production methods, fish biology and health, sustainability and environmental management, ecotoxicology, aquatic engineering, epidemiology, and the economics, legislation, business and marketing of the aquaculture industry, and likely has more aquatic veterinary medicine than any other veterinary curriculum globally.

The new Bachelor of Veterinary Medicine is a 6-year degree that fulfils the Cornell prerequisites, followed by a close copy of the core Cornell DVM foundation. There was also an opportunity to develop a number of courses to fulfil the team's vision to be the premier provider of comprehensive, evidence-based veterinary training, research and service in Asia, with particular emphasis on emerging infectious diseases,



es, food safety, animal welfare and aquatic production. Even the early years of the degree are filled with courses on aquaculture, animal welfare, zoonoses, food safety and infectious diseases, which will hopefully instil a sense in students of alternatives to the more traditional career path that leads straight into small animal clinical practice.

The veterinary curriculum emphasises day-1 competencies for veterinarians who wish to enter the aquatic industries, and will prepare students well for further training in aquatic medicine, including an MSc in Aquatic Production and Veterinary Health, which is jointly run by Hong Kong City University and the University of Stirling's Institute of Aquaculture. Graduates will be in a unique position to tackle the complex issues that the world will face over the next few decades as it struggles to produce food for an estimated 9 billion people by 2050, and will be able to pursue a variety of aquaculture related fields such as fisheries, veterinary medicine, pharmaceuticals, animal nutrition, veterinary products, academia, environmental monitoring, sustainability, food production, government regulation and food safety. It is anticipated that graduates will help service many subsistence aquaculture operations in China, and help develop more viable and sustainable production.

Early indications are that the school is on the right track. Facilities continue to be built or acquired. To this end, the School has acquired Peace Avenue Veterinary Clinic, the largest veterinary practice in Hong Kong, with approximately 30 veterinary practitioners, including 10 specialists, and has leased land in the new territories for an aquaculture research facility. The Veterinary School is also actively searching for land in Hong Kong to establish an aquaculture farm, which is a major expense. The team is recruiting local primary



Hong Kong City University's Aquaculture Research Farm



Dr. Wong examining copper-alloy netting being used in Shenzhen to reduce bio-fouling of aquaculture net pens, as part of collaborative research projects with Wieland Industries

producers to provide farming experiences for students to complement their clinical education and has a strong relationship with the local Hong Kong Jockey Club for equine placements, internships and clinical education. Finally, the Veterinary School has set up a major veterinary diagnostic laboratory, catering to the specific needs of local and regional practitioners and is exploring research facilities and collaboration with the South China Sea Fisheries Research Institute that is part of the Chinese Academy of Fisheries Science.

The School continues on its growth path with an active recruitment schedule for faculty staff, with a further four members joining it in the second half of this year. PhD students in a jointly-supervised program with Cornell have embarked on their placement in Ithaca, upstate New York, and the School has been enlarged by the incorporation of the Department of Biomedical Sciences. It is now the College of Veterinary Medicine and Life Sciences.

To add international credibility and ongoing quality assurance, the program has been subjected to scrutiny by the Australasian Veterinary Boards Council (AVBC), in the same manner as veterinary schools in Australia and New Zealand. The AVBC's accreditation body visited with the school in December of 2015 and



2016, and issued a 'Letter of Reasonable Assurance' in March 2017. One of the commendations from the accreditation visit was for the active and frequent provision of continued professional development events. The School has already provided more than 60 events and will continue to provide these locally and also regionally to help to upskill veterinarians in the region, particularly those from mainland China. And anybody from Australia is welcome to join us, as well.

For more information, go to the website:
<http://www.cityu.edu.hk/cvmls/en/index.html>



Hong Kong City University's aquatic veterinary programme is also exploring collaborative opportunities with Ocean Park



MSc in AQUATIC PRODUCTION AND VETERINARY HEALTH

City University of Hong Kong's School of Veterinary Medicine working jointly with the Institute of Aquaculture, University of Stirling, Scotland, is introducing an **MSc course in AQUATIC PRODUCTION AND VETERINARY HEALTH** in **SEPTEMBER 2017**. A team of experienced staff of aquatic veterinary medicine and higher education from Hong Kong and Scotland has created this MSc programme.

The programme covers professional subject areas such as:

- Aquatic Animal Biology and Health
- Aquatic Animal Production Systems
- Bacterial, Viral, and Parasitic Diseases
- Aquatic Animal Reproduction and Genetics
- Aquatic Animals in the Environment
- Aquatic Animal Nutrition
- Epidemiology and Health Control
- System Pathology
- Immunology
- Ecotoxicology

Principles of the science of **AQUATIC PRODUCTION AND VETERINARY HEALTH** are central to this programme. Graduates will have a thorough understanding of aquatic animals' needs, the environment they live in, various production systems and the relevant disease conditions that can occur. Graduates will be able to plan and deliver the best possible health outcomes. **For more details, please visit www.cityu.edu.hk/svm/links/msapvh.asp.**



About the MSc Programme

Location	:	Hong Kong
Duration	:	1 year
Mode of Teaching & Learning	:	Full time, face-to-face & thesis research project
Start Date	:	September 2017

School of Veterinary Medicine

Remarks: This is an exempted course under the Non-local Higher and Professional Education (Regulation) Ordinance of the HKSAR (Ref. No 432723). It is a matter of discretion for individual employers to recognise any qualification to which this course may lead.

Enquiry : svmenquiry@cityu.edu.hk
 Telephone : 852 3442 6361
 Fax : 852 3442 0589





**MEETINGS OF INTEREST TO
AQUATIC VETERINARIANS**

Veterinarians attending these meetings may be awarded veterinary CE/CPD credit towards annual re-licensure or re-registration to practice veterinary medicine. Individuals should check with the organizers to see if CE/CPD certificates are provided.

AQUACULTURE AMERICA 2018

February 19-22, 2018
Las Vegas, Nevada, USA

This session is intended for Veterinary Continuing Education. Veterinarians attending will receive a veterinary CE certificate of participation. Of particular interest are presentations dealing with programs, services and tools that enhance aquatic veterinary practice, and fulfill aquaculture industry's and client's needs for increase production, profits and meeting regulatory requirements.

Submit an abstract on-line through WAS.org

THE 34th WVA CONGRESS

May 5-8, 2018
Barcelona, Spain

This is a unique opportunity for veterinarians in all branches to come together to explore the challenges that face animal health and welfare, to find solutions where possible, and to demonstrate the value of the profession for the public good in a changing world.

To submit abstracts for oral or poster presentations, please go to <http://wvac2018.org/scientific-program/call-for-abstracts/>

**3rd WAVMA Conference &
Biosecurity Workshop**

May 18-22, 2018 - St. Kitts, West Indies



Register now and consider speaking at the 3rd WAVMA Conference & Biosecurity Workshop in May 2018! Go to: <http://bit.ly/2zNj2Be>

**Discover core knowledge, skills & experience
needed to become a WAVMA Certified Aquatic
Veterinarian (CertAqV)**

Did you know that WAVMA's **CertAqV Program** offers members the opportunity to become recognized and certified as having competency in 9 core areas deemed necessary to practice aquatic veterinary medicine? Find out more information online at: <http://www.wavma.org/CertAqV-Pgm>.

THE J. L. PITTS AQUATIC VETERINARY EDUCATION AWARDS PROGRAM, 2017

The John L. Pitts Aquatic Veterinary Education Awards Program needs your help to assist veterinary students and recent graduates learn more about veterinary involvement in aquatic animal health.

*Stories of awardees are available in past and upcoming issues of
The Aquatic Veterinarian.*

XI International Congress Exotic, Zoo and Wild Animals Medicine and Surgery

March 21–23, 2018

Paris, France.

For more information:

<http://yaboumba.org/congress-2018/>

43rd Eastern Fish Health Workshop

April 3-7, 2018

Chattanooga, TN (USA)

Exotic Pet Medicine – Two-Day Conference

April 14–15, 2018

Warsaw, Poland.

For more information:

<http://yaboumba.org/congress-2018/>

3rd WAVMA Conference and Biosecurity Workshop

May 18-22, 2018

St. Kitts (West Indies)

AVMA Convention

July 13-17, 2018

Denver, CO (USA)

67th Annual International Conference of the Wildlife Disease Association

August 5–10, 2018

St. Augustine, FL, USA

For more information:

<http://conference.ifas.ufl.edu/wda2018>

8th International Symposium on Aquatic Animal Health

September 2-6, 2018

Charlottetown, Prince Edward Island (Canada)

ExoticsCon 2018 - Association of Avian Veterinarians, Association of Exotic Mammal Veterinarians, Association of Reptilian and Amphibian Veterinarians Joint Conference

September 22–27, 2018

Atlanta, GA, USA

For more information: <http://www.exoticscon.org>

ICARE 2017

April 28 – May 2, 2019

London, Great Britain.

For more information: <http://www.icare2019.eu>

ExoticsCon 2019 - Association of Avian Veterinarians, Association of Exotic Mammal Veterinarians, Association of Reptilian and Amphibian Veterinarians Joint Conference concurrent with AAZV

September 27–October 5, 2019

St. Louis, MO, USA



43rd WSAVA Congress

September 25-28, 2018

Singapore

Plan ahead for World Congress 2018 in Singapore, the Tropical Garden City!

Our Congress will be held at our famous Marina Bay Sands, where you may lay down by the infinity pool after an eventful day of lectures. So, come on down and indulge yourself, because we all deserve it!

10 Bayfront Avenue

Singapore 018956

Website: <http://www.marinabaysands.com/>

Abstract submission deadline: February 27, 2018

Conference Registration: <http://www.wsava2018.com/registration-hotels/registration#.Wjrl87enEz0>



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SC = Student/Scholarship Committee Report

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Megan Strobel – TAV 10(2): 16 SC
Julius Tepper – AVN 5(3): 12-13
Sharon Tiberio – TAV 8(3): 17
Laura-Daniela Urdes – TAV 7(4): 14-15; TAV 8(3): 18
Jonas Vaitkus – AVN 5(1): 10-11 SC
Bill Van Bonn – TAV 9(2): 29
Vasile Vulpe - TAV 11(4) 14-15
Zac Waddington – TAV 8(4): 17 SC
Chris Walster – TAV 7(2): 10-12
Scott Weber – AVN 3(4): 9; AVN 6(4): 10-13;
Tatiana Weisbrod - TAV 11(1) 14-15 SC
Peter Werkman – TAV 9(3): 26-27; TAV 10(4): 20
Sophie Whoriskey – AVN 5(4): 5 SC
Jen Wilson-Cohen – TAV 8(3): 13 SC
Hillary A. Wolfe – TAV 9(2): 18 SC



AQUATIC

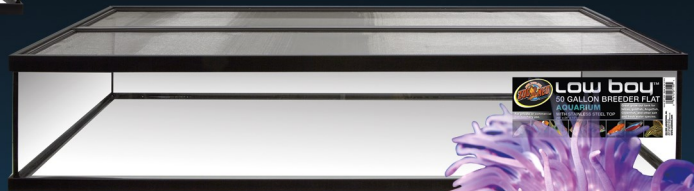
Action

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