

## Getting your feet wet

- Guidance & Resources for the developing Aquatic Veterinarian.



Dr Richmond Loh

BSc, BVMS, MANZCVS (Aquatics & Pathobiol), MPhil (Pathol), CertAqV, CMAVA  
2014 President, wavma.org

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Recording available at



[http://youtu.be/O8g8kL\\_xsM0](http://youtu.be/O8g8kL_xsM0)

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### Why do we need Aquatic Veterinarians?

Predictions:

- By 2030, 62% of seafood from aquaculture.
- By 2050, 50% animal protein from aquaculture.
- Require 100,000 veterinarians to help increase food production & security (cf similar agriproduction [e.g. beef]).

Courtesy: C. Walster.



### How do Aquatic Veterinarians get jobs?

- When things start happening, employers are looking for those with experience.
- How do you get experience, when you don't have experience?
- What do we need to know?



### Where do aquatic vets work?

- Few vets work fulltime in aquatics
- Many incorporate a component of aquatics to their practice.
- Examples:
  - Aquaculture farms
  - Aquariums / marine parks
  - Zoos/wildlife & museums
  - Laboratories



### What does an Aquatic Vet need to know?

WAVMA identified 9 core areas:

1. Aquatic Environment and Life Support Systems.
2. Taxonomy, Anatomy and Physiology.
3. Husbandry and Industries.
4. Pathobiology and Epidemiology of Aquatic Animal Diseases.
5. Diagnostics and Treatment of Aquatic Animal Diseases.
6. Clinical Veterinary Experience and Client Communications.
7. Public Health, Zoonotics and Seafood Safety.
8. Legislation, Regulations, and Policies.
9. Principles of Aquatic Animal Welfare.



## Current Veterinary Education & Training

- Veterinary degree is intensive, limited flexibility in the curriculum for specialised training.
- Some universities provide final year electives in aquatics.
  - 58% of veterinary schools in 19 European countries
  - 84% of veterinary schools in North America provided content relevant to aquatic veterinary issues.

Courtesy: C. Walster & D. Scarfe



## Current Veterinary Education & Training

- Veterinary schools with established aquatic component:
  - LMU Munich,
  - Institute of Aquaculture Stirling,
  - University of Florida,
  - Atlantic Veterinary College at UPEI,
  - North Carolina State University College of Veterinary Medicine,
  - Edinburgh & Glasgow Veterinary Schools

Many others following suit.

Courtesy: C. Walster & D. Scarfe



## Current Veterinary Education & Training

- Extra-mural experience difficult to get.
- Few private practices focus on aquatic veterinary medicine.
- Fish cases intermittent and difficult to schedule (always “urgent”).
- Experience through academic departments, diagnostic labs, research facilities & public aquaria (where there is a veterinarian).



## Current Veterinary Education & Training

- Generally, for “Day-1 Competency” it requires training beyond veterinary school (undergrad, grad, post-grad electives).
- WAVMA encourages Veterinary School Chapters & provides Aquatic Veterinary Education Grants through the WAVMA/AVMF program.
- Residency programs approved by the American College of Zoological Medicine (ACZM): North Carolina, California, and Florida



## Aquatic Education & Training

- Specific Courses
  - MSc (Aquatic Vet Studies), University of Stirling <<http://www.stir.ac.uk/>>
  - Seavet <<http://conference.ifas.ufl.edu/ame/seavet/>>
    - Clinical aspects of captive & wild aquatic megafauna, and fishes.
  - Aquavet <<http://vet.cornell.edu/aquavet/>> Cornell U. & U. Penn.
    - I: Intro: Ecology, WQ, lifecycles, anatomy, medicine, pathology (4w)
    - II: Histopathology of farmed & wild, invertebrates & fish (2w)
    - III: Clinical Aspects of captive aquatic animal medicine (5w)
  - Aquamed <<http://www.vetmed.lsu.edu/aquamed.htm>>
  - Marvet <<http://marvet.org>>
    - Marine megafauna (4w). Lectures & wet labs (e.g. fish, reef, turtle, bird, dolphin). Diving.



## Aquatic Education & Training

- Specific Courses
  - NCSU Fish Medicine short courses - Koi, Goldfish, and Pond Health Management <<http://www.cvm.ncsu.edu/conted/fishhealth.html>>
  - UPEI – Fish Disease Diagnostics for Practicing Veterinarians.
  - Mote Marine Lab – Diseases of coral and other reef organisms <<http://isurus.mote.org/>>
  - University of Arizona – Shrimp Pathology short course.
  - Veterinary Information Network (VIN) – Basic Fish Medicine. <<http://vin.com>>
  - Diseases of warmwater fish <<http://conference.ifas.ufl.edu/wwf/>>
    - Fish pathology and treatment (2w, even years)





## Aquatic Education & Training

- Online Courses
  - WAVMA WebCEPD <<http://www.wavma.org/WebCEPD>>
  - University of Florida, Distance Learning Online Course <<http://aquatic.vetmed.ufl.edu/education/courses/distance-learning-courses/>>
  - University of Wisconsin, Fish Health Courses for Producers and Veterinarians <[https://ce.vetmed.wisc.edu/Fish\\_Health\\_Courses\\_for\\_Producers\\_and\\_Veterinarians](https://ce.vetmed.wisc.edu/Fish_Health_Courses_for_Producers_and_Veterinarians)>
  - The Aquarium Vet <[www.theaquariumvet.com.au](http://www.theaquariumvet.com.au)>



## Aquatic Education & Training WebCEPD



| Date              | Speaker          | Topic  |
|-------------------|------------------|--|
| August 28, 2014   | Jo Bannister     | Field Surgical Insertion of Catfish Radio Transmitters |
| September 3, 2014 | Nahid Stephens   | Dolphin Diseases                                       |
| October 8, 2014   | Susan Kueh       | Barramundi (Asian Seabass) Disease Management          |
| November (TBD)    | Véronique LePage | Seahorse Diseases                                      |
| December (TBD)    | Nick Saint-Erne  | Fish Anesthesia and Surgery                            |

**2014 WebCEPD Program**

This year, the WAVMA Communications Committee is re-launching the Aquatic Vet WebCEPD Program by embracing the internet as a means of more equitably sharing benefits among a global network of our members. After testing several systems over the past year for delivering educational webinars to members, the WAVMA Executive Board settled on one that is simple and automatically sends reminders to those that register. While these WebCEPD webinars will be delivered by members in different time zones around the world, recordings of the programs will be available through the WAVMA website for future viewing.

Importantly, these webinars are planned to provide continuing education and professional development (CEPD) credit to those that require a certain amount of CEPD every year to be re-licensed or re-registered to practice veterinary medicine. Additionally, instructors at veterinary schools might

## Aquatic Veterinary Qualifications

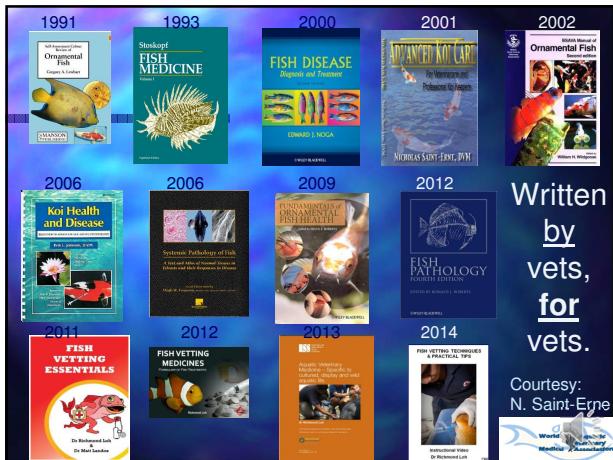
- WAVMA
  - CertAqV. Peer-reviewed recognition of KSE.
- ANZCVS
  - Membership exams. Purely Aq.
- EBVS
  - ECAAH exams. Purely Aq. Specialist reg.
- ACZM
  - Exams. Very broad. More than aquatics.
- PhD, MPhil, Hon
  - Research focused. Narrow field. Many opportunities.



## Aquatic Veterinary Qualifications pending

- Specialist Veterinary Registration
  - AAVF
  - South African Veterinary Authority
  - ANZCVS – AAH - Fellowship





Written  
by  
vets,  
for  
vets.

Courtesy:  
N. Saint-Erne

## Journals

Courtesy: T. Watlzeck

- *Journal of Aquatic Animal Health*
- *Journal of Fish Diseases*
- *Diseases of Aquatic Organisms*
- *Journal of the Fish Veterinary Society (UK)*
- *Veterinary Clinics of North America, Exotic Animal Practice*
- *Seminars in Avian and Exotic Pet Medicine*
- *Journal of Invertebrate Pathology*
- *Marine Mammal Science*
- *Journal of Wildlife Diseases*
- *Journal of Zoo and Wildlife Medicine*
- *Exotic DVM*
- *JAVMA*
- *Compendium*



## Fact Sheet Resources



- University of Florida, IFAS
  - <http://edis.ifas.ufl.edu/deptlist.html>
- USDA APHIS, Veterinary Services
  - <http://www.aphis.usda.gov/>
- Regional Aquaculture Centers (5)
  - SRAC
    - <http://www.msstate.edu/dept/srac/publicat.htm>

Courtesy: T. Watlzeck

## Websites

Courtesy: T. Watlzeck

- Coral Health and Monitoring Program (CHAMP)
  - <http://www.coral.noaa.gov/>
- Shellfish Diseases
  - [http://www.pac.dfo-mpo.gc.ca/sci/shelldis/toc\\_e.htm](http://www.pac.dfo-mpo.gc.ca/sci/shelldis/toc_e.htm)
- Trout Histology Image Collection, USFWS online at:
  - <http://aquaticpath.umd.edu/fhm/index.html>
- Atlas of Normal Fathead Minnow Histology:
  - <http://aquaticpath.umd.edu/fhm/index.html>
- Diseases of Zebrafish in Research Facilities:
  - <http://zfin.org/zirc/disMan/diseaseManual.php>

## ListServs



- AquaVetMed (AVMA)
  - Contact: [DScarfe@avma.org](mailto:DScarfe@avma.org)
- WAVMA
- AAFV
- Marine Mammals: MARMAM
  - [listserv@uvm.uvic.ca](mailto:listserv@uvm.uvic.ca)
  - <http://marinemammal.vetmed.ufl.edu>
- Invertebrates: crust-l@vims.edu
- Marine pathology: [marine\\_pathol@vims.edu](mailto:marine_pathol@vims.edu)

## Professional Aquatic Associations

- WAVMA (Global) <[wavma.org](http://wavma.org)>
- ANZCVS (Aust. & NZ) <[anzcv.org.au](http://anzcv.org.au)>
- AAFV (US) <[fishvets.org](http://fishvets.org)>
- FVS (UK) <[fishvetsociety.org.uk](http://fishvetsociety.org.uk)>
- EAFF (Europe, non-vets) <[eafp.org](http://eafp.org)>
- Asian Fisheries Society (non-vets) <[asianfisheressociety.org](http://asianfisheressociety.org)>



## Professional Aquatic Associations

- American College of Zoological Medicine.
- Association of Aquatic Veterinarians of Nigeria.
- Association Francaise des Veterinaires Aquacoles.
- Canadian Aquaculture Veterinary Association.



## Professional Aquatic Associations

- Eastern Aquaculture Veterinary Association.
- Sociedad Chilena de Medicos Veterinarios Especialistas en Acuicultura.
- International Society of Aquatic Animal Epidemiology.
- International Association of Aquatic Animal Medicine.



## Professional Associations that support Aquatics

- AVMA (American Veterinary Medical Association)
- VIN (Veterinary Information Network)
- WVA (World Veterinary Association)
- WSAVA (World Small Animal Veterinary Association)
- FVE (Federation of Veterinarians of Europe)
- NAVC (North American Veterinary Community)
- FAVA (Federation of Asian Veterinarian Associations)



## Professional Associations that support Aquatics

- The Society for Marine Mammology (SMM).
- European Association for Aquatic Mammals (EAAM).
- European Cetacean Society (ECS).



## WAVMA Student Chapter

### Programs and privileges

- Assistance in organizing and promoting Chapter programs and activities.
- Access to recorded webinars and live web-based presentations from experts around the world.
- Low annual WAVMA Student Membership (\$25) - 50% Chapter member's dues may be available to support Chapter-organized activities.
- Reduced rate (50%) WAVMA Full Membership the year after graduation.
- WAVMA veterinary student/new graduate scholarships.
- Access to the latest editions of WAVMA's quarterly newsletter ("The Aquatic Veterinarian").
- Access to WAVMA member-only webpages & programs.
- Discounted book purchases from select publishers.
- Aquatic veterinary externship, internship and residency programs and job listings.
- Free or discounted registration for WAVMA meetings, symposia, conferences or educational webinars.
- Participation in the WAVMA Certified Aquatic Veterinary Practitioner (Cert-AqVP) Program.
- Access to WAVMA e-mail listservs, including Members-L, Student-L (all students) and (if requested) a Chapter-dedicated listserv.



## Internships

### THE AQUATIC VETERINARIAN

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#### SeaWorld (6-8 weeks)

SeaWorld offers externships at each of its 3 locations. You are given an application where you rank each work. Externs get to work with these wild birds that are brought for rehabilitation. You will be assigned to the veterinary staff on the basis of your interest. Housing is provided, including an extended stay hotel with a small kitchen.

#### The Marine Mammal Center (6-8 weeks)

Located in Sausalito, CA, the Marine Mammal Center offers an externship in aquatic animal rehabilitation and research. It is very seasonal, with most work occurring in the summer. You will work with the veterinary staff 3-4 days per week, and the rest of the time you will be caring for and feeding once or twice a week. Housing is provided.

#### Atlantic Marine Center (6-8 weeks)

In Mystic, CT, just over the coastal Rhode Island border, houses a large collection of marine mammals. You work primarily with the veterinary intern, who is also the director of the program. You will also get very proficient in taking and processing samples, and you will be involved in research during this externship. No housing is provided, but you will be staying in a dormitory on the property at the aquarium, who can provide you with a place to stay. You will be provided with a car for rotation where you'll need a car to check out all the locations.

#### Georgia Aquarium

Georgia Aquarium is one of the newest aquariums in the world. It has one new procedure suite and one of the most outstanding tanks in the world. Housing is provided, and you will be staying in a dormitory since the aquarium is located in downtown Atlanta, GA.

#### US Navy Marine Mammal Program (4 weeks)

The US Navy trains marine mammals to perform tasks under a high priority for those interested in marine mammal medicine. This program is located in San Diego, CA, and the Navy is looking for

#### Vancouver Aquarium (2-4 weeks)

Located in Vancouver, Canada, the Vancouver Aquarium takes externs to work with their marine mammals, including sea lions, seals, reptiles and fish. A literature review project is required, and you will be staying in a dormitory. Make sure your passport is up to date.

#### Georgia Sea Turtle Center (2-6 weeks)

The Georgia Sea Turtle Center is located on Jekyll Island, Georgia, and the center focuses on Georgia's sea turtle population. They rehabilitate both sea turtles and native land turtles. You will be working with the veterinary intern. This is one of the best facilities to participate in the Internship Program. You will be staying in a dormitory. A research project is required for non-4th year students. If you are interested, you must have a car. A car is recommended.

#### National Aquarium

National Aquarium is located in Baltimore, MD and houses a large collection of sea lions, penguins, manatees, reptiles and birds. Their chief veterinarian is a very experienced and knowledgeable about cold stress in turtles and has made a significant contribution to the field of sea turtle rehabilitation. Externs are required to prepare a case report, and you will be staying in a dormitory. No housing is available, but there are lots of hotels in the area.

#### New England Aquarium

Located in Boston, MA, the New England Aquarium houses a large collection of sea lions, marine mammals and turtles. Their chief veterinarian is a very experienced and knowledgeable about cold stress in turtles and has made a significant contribution to the field of sea turtle rehabilitation. Externs are required to prepare a case report, and you will be staying in a dormitory. No housing is available, but there are lots of options nearby.

### What does it take?

1. Experience
2. Training/qualifications
3. Persistence
4. Willingness to move
5. Network
6. Specialise in an area of veterinary science & bring that with you.



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[wavma.org](http://wavma.org)

