



Training of National Focal Points for Aquatic Animal Health (Cycle IV)

2 - 4 October 2023 Kigali, Rwanda



Reporting guidelines and tools - International regulatory information systems – United Kingdom

Richard Paley and Edmund Peeler



WOAH Collaborating Centre for
Emerging Aquatic Animal diseases

Reference Centre

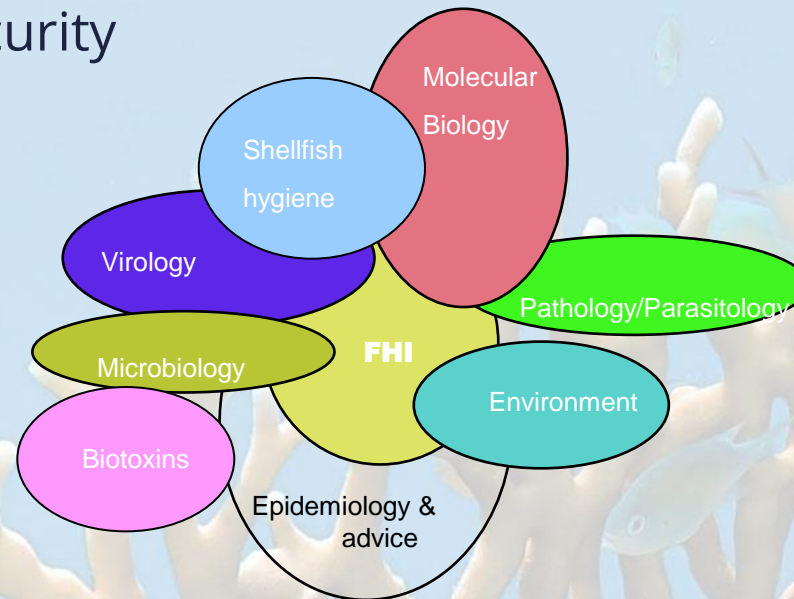


World Organisation
for Animal Health
Founded as OIE

Weymouth laboratory

Aquatic Animal Health and Food Safety

Maintaining the health of wild & farmed seafood to minimise economic loss & maximise food production/security





- **International Centre of Excellence for Aquatic Animal Health**
- **International Centre of Excellence in Seafood Safety**
- **UK national reference laboratory for Aquatic Animal Diseases**
- **UK national reference laboratory for seafood safety**



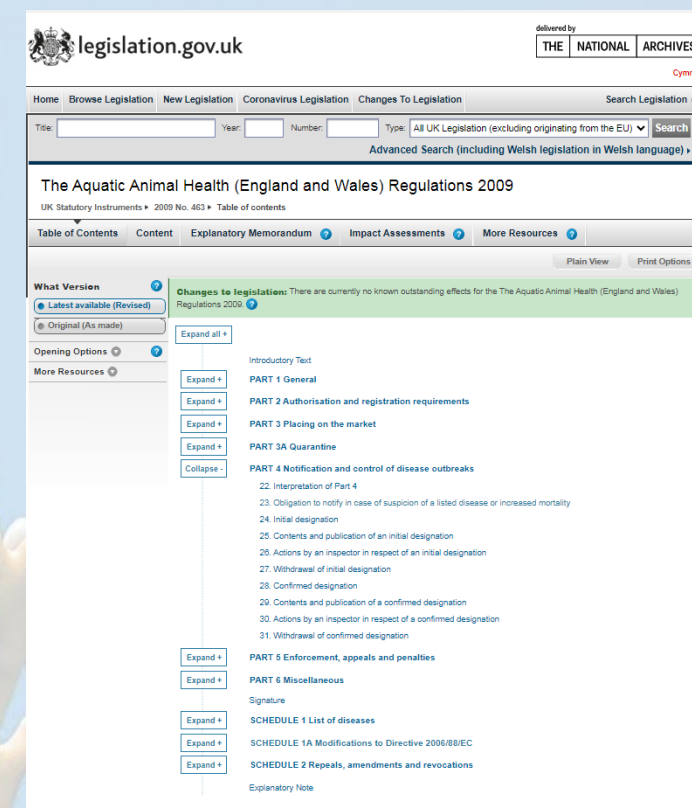
- **Collaborating Centre for Emerging Aquatic Animal Diseases**
- **Reference laboratory for KHV & SVC**



- **Reference Centre for Antimicrobial Resistance (AMR) with VMD & APHA**
- **Reference Centre for Bivalve Molluscs Sanitation**

Legal requirement to report – The Animal Health regulations (England and Wales) 2009

- Obligation to notify in case of suspicion of a listed disease or increased mortality
- 1) A relevant person is guilty of an offence if that person—
 - (a) knows or suspects that a listed disease is present in aquatic animals; and
 - (b) fails immediately to notify the competent authority of the information or other matter on which that knowledge or suspicion is based.
 - (2) A relevant person is guilty of an offence if that person—
 - (a) knows or suspects that increased mortality has occurred or is occurring in aquaculture animals; and
 - (b) fails immediately to notify the competent authority or a veterinarian of the information or other matter on which that knowledge or suspicion is based.
 - (3) In this regulation “a relevant person” means— (a) the owner of, or any person attending, aquatic animals; (b) any person accompanying aquaculture animals during transport; (c) any veterinarian, or other professional, involved in aquatic animal health services; or (d) any other person with an occupational relationship to aquatic animals of susceptible species or to products of such animals.



The screenshot shows the legislation.gov.uk website. At the top, there is a search bar with fields for Title, Year, Number, and Type. Below the search bar, the title "The Aquatic Animal Health (England and Wales) Regulations 2009" is displayed. The page includes a table of contents with expandable sections for various parts of the regulations, such as "PART 1 General", "PART 2 Authorisation and registration requirements", and "PART 4 Notification and control of disease outbreaks".

[The Aquatic Animal Health \(England and Wales\) Regulations 2009 \(legislation.gov.uk\)](https://www.legislation.gov.uk/uksi/2009/463)

Reporting - Listed diseases

Allows UK to demonstrate that it meets WOAH standards for reporting (Articles 1.1.2 to 1.1.4)

This provides the competent authority (Fish Health Inspectorate) the legal basis for passive surveillance (risk based)

Not all WOAH listed diseases are listed in the UK and we control some that are not WOAH listed

WOAH	UK (Eng & Wales)
Fish	
Infection with <i>Aphanomyces invadans</i> (epizootic ulcerative syndrome)	
Infection with epizootic haematopoietic necrosis virus	*Epizootic haematopoietic necrosis
Infection with <i>Gyrodactylus salaris</i>	Infection with <i>Gyrodactylus salaris</i>
Infection with HPR-deleted or HPR0 infectious salmon anaemia virus	Infectious salmon anaemia (ISA); HPR-deleted
Infection with infectious haematopoietic necrosis virus	Infectious haematopoietic necrosis (IHN)
Infection with koi herpesvirus	Koi herpes virus (KHV) disease
Infection with red sea bream iridovirus	
Infection with salmonid alphavirus	
Infection with spring viraemia of carp virus	Spring viraemia of carp
Infection with tilapia lake virus	
Infection with viral haemorrhagic septicaemia virus	Viral haemorrhagic septicaemia (VHS)
	Bacterial kidney disease
Molluscs	
Infection with abalone herpesvirus	
Infection with <i>Bonamia ostreae</i>	Infection with <i>Bonamia ostreae</i>
Infection with <i>Bonamia exitiosa</i>	*Infection with <i>Bonamia exitiosa</i>
Infection with <i>Marteilia refringens</i>	Infection with <i>Marteilia refringens</i>
Infection with <i>Perkinsus marinus</i>	*Infection with <i>Perkinsus marinus</i>
Infection with <i>Perkinsus olseni</i>	
Infection with <i>Xenohalotis californiensis</i> .	
	Ostreid herpesvirus 1 μ var (OsHV-1 μ var)
	*Infection with <i>Microcytos mackini</i>
Crustacea	
Acute hepatopancreatic necrosis disease	
Infection with <i>Aphanomyces astaci</i> (crayfish plague)	
Infection with decapod iridescent virus 1	
Infection with <i>Hepatobacter penaei</i> (necrotising hepatopancreatitis)	
Infection with infectious hypodermal and haematopoietic necrosis virus	
Infection with infectious myonecrosis virus	
Infection with <i>Macrobrachium rosenbergii</i> nodavirus (white tail disease)	
Infection with Taura syndrome virus	*Taura syndrome
Infection with white spot syndrome virus	White spot disease
Infection with yellow head virus genotype 1.	*Yellowhead disease
Amphibia	
Infection with <i>Batrachochytrium dendrobatidis</i>	
Infection with <i>Batrachochytrium salamandrivorans</i>	
Infection with Ranavirus species.	
Infection with <i>Batrachochytrium dendrobatidis</i>	

*Exotic to Eng & Wales

Emerging diseases:

- The obligation to report increased mortality should capture new and emerging diseases
- Our system relies on cooperation of the industry. The CA has obligation to work with industry to ensure the importance of reporting is understood. It is a collaborative and supportive approach rather than a tough policing role (though on occasion that as well as)

Recording obligations

- Obligation to maintain records:
medicines, mortalities and movements

Recording systems

- Real time recording of live fish movements between locations in a fish movements database
- and
- Purchase, use and disposal of veterinary medicines and treatments
 - Working towards a section for real time recording of mortality data
 - Provides for risk assessment and rapid contact chasing in event of disease outbreak

BETA This is a new service – your [feedback](#) will help us to improve it.

Important

Click [here](#) for more information about the redeveloped service.

Fish Health Inspectorate Online

Welcome to Fish Health Inspectorate Online. This service aims to assist Aquaculture Production Businesses (APB) in England and Wales with compliance and record keeping.

It currently provides the following services:

- Recording live aquatic animal movements to and from all authorised and registered fish and shellfish holdings in England and Wales
- Recording the purchase, use, and disposal of veterinary medicines
- Recording the purchase, use, and disposal of non-prescription medicines and treatments

For more information about your statutory requirements for record keeping, to transport live fish in England and Wales and other services the Fish Health Inspectorate plan to deliver via this service [see the about section](#).

[Live fish movements](#)

Recording live aquatic animal movements to and from all authorised and registered fish and shellfish holdings in England and Wales.

[Prescription medicines](#)

Recording the purchase, use, and disposal of prescription veterinary medicines.

[Non-prescription treatments](#)

Recording the purchase, use, and disposal of non-prescription treatments.

[My account](#)

Update your email, password, phone number, notification preferences, and links to businesses/fish and shellfish holdings (sites).

[Accessibility policy](#)

This policy explains how accessible the documents we publish are.

[Cookies policy](#)

Cookies are small files saved on your phone, tablet or computer when you visit a website.

Active surveillance

- In the E&W this consists of regular audit visits to farms
- Maintains the good relationship between CA and industry
- Sampling is responsive apart from disease control zones, disease free compartments

Potential shortcomings

- Diseases of wild populations are under lower scrutiny, especially if farmed populations are not present locally to act as sentinels
- Lack of compensation for farmers can act as a disincentive for reporting

WOAH Collaborating Centre for Emerging Aquatic Animal Diseases



Centre for Environment
Fisheries & Aquaculture
Science



WOAH Collaborating Centre for
Emerging Aquatic Animal diseases

Reference Centre



World Organisation
for Animal Health
Founded as OIE

- [International Database on Aquatic Animal Diseases - Cefas \(Centre for Environment, Fisheries and Aquaculture Science\)](#)



Emerging disease

An **emerging disease** is defined as a new infection resulting from the **evolution or change** of an **existing pathogen** or parasite resulting in a change of host range, vector, pathogenicity or strain;

or the occurrence of a **previously unrecognized** infection or disease.

A **re-emerging disease** is considered an already known disease that either shifts its geographical setting or expands its host range, or significantly increases its prevalence.



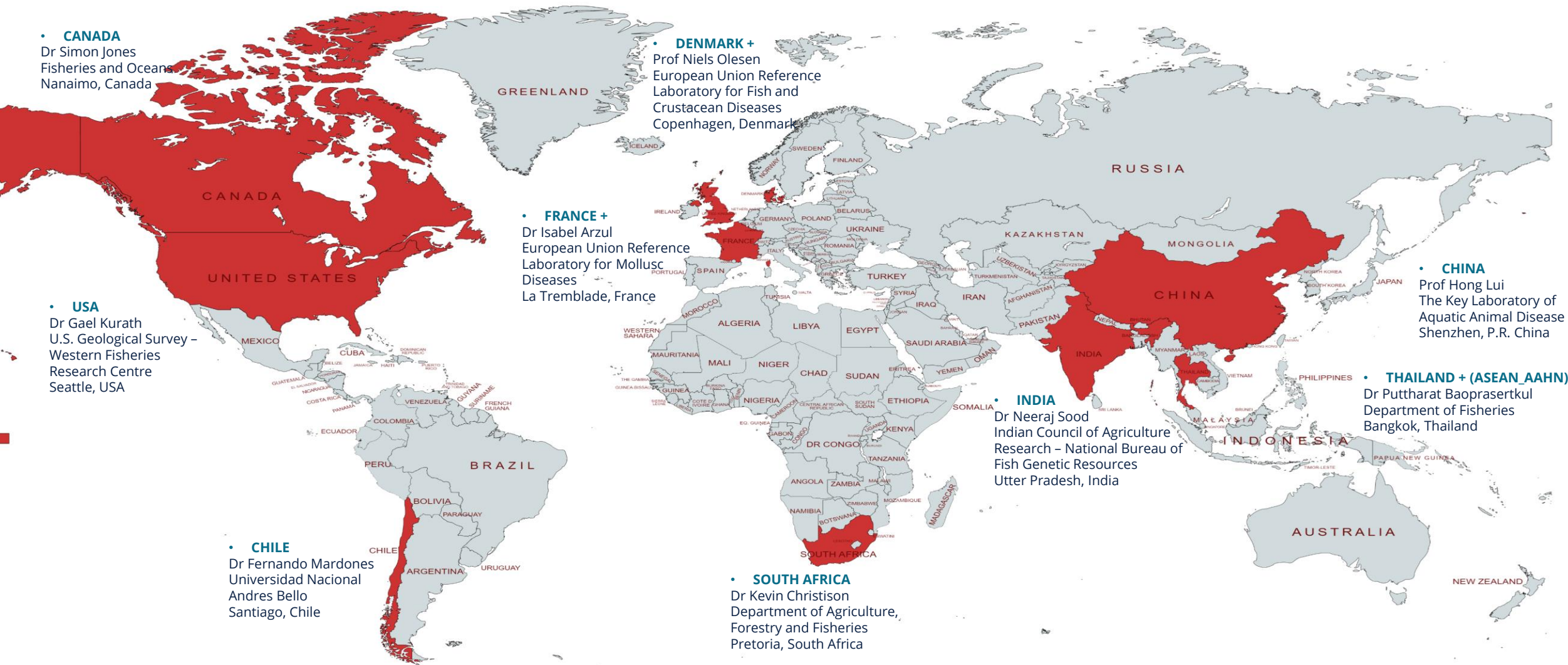
Aims

Rapid detection, characterization and reporting of the causative agents of [emerging] disease provide a crucial first step in their control. For this reason, efficient and accurate detection and description of **emergent and potentially emergent** aquatic animal disease threats forms the central precept of this OIE Collaborating Centre

We aim to function as a global resource for health and disease research, diagnostics, pathogen detection and description, and knowledge sharing, associated with aquatic animals

Key Functions

- Securing aquatic animal health, including **identifying new and emerging disease conditions**, reducing the transmission of diseases through risk management decisions based on prompt and **effective scientific investigations**.
- Ensuring transparency via dissemination of listed and emerging aquatic animal disease via the CCEAAD website, International Database on Aquatic Animal Diseases (IDAAD) and the Registry for Aquatic Pathology (RAP).
- **Collecting, analysing and disseminating** scientific information via the same mechanisms and directly to the OIE.
- Ensuring international solidarity through the ability to **offer expertise** to countries where aquaculture provides a critical food source threatened by disease occurrence.
- Promotion of diagnostic services through provision of **training courses and workshops**.
- **Enhancing the capacity and sustainability** of national diagnostic services to tackle emerging diseases in aquatic animals.



Created with mapchart.net

A Developing AAH Network



Rules of engagement

- Country approach led – e.g. request for assistance with disease investigation or capacity building
- Ensure national competent authorities aware and engaged
- Work with local associate laboratories, inc. EURLs and other OIE collaborating centres and reference laboratories.

Information systems

- IDAAD

- [International Database on Aquatic Animal Diseases - Cefas \(Centre for Environment, Fisheries and Aquaculture Science\)](#)
- Brings together WOAHA and non-WOAH data via continuous monitoring of over 30 information sources



The screenshot shows the homepage of the International Database on Aquatic Animal Diseases (IDAAD). The header includes the Cefas logo and navigation links: ABOUT US, OUR SCIENCE, OUR EXPERTISE, OUR IMPACT, NEWS AND RESOURCES, DATA AND PUBLICATIONS, and a search bar. The main heading is "INTERNATIONAL DATABASE ON AQUATIC ANIMAL DISEASES". Below this, a paragraph explains the database's purpose: "This database is for those needing to access the WOAHA (World Organisation for Animal Health) published data on the occurrence of the WOAHA-listed aquatic animal diseases in all member countries and/or additional data in the published scientific literature." It then states, "The data is grouped in the following ways:" followed by a bulleted list: "WOAHA data", "non-WOAHA data", and "all data." Further down, it describes the content of the tables: "The relevant tables cover each disease, host species, disease location and reference (information source). Within these general areas, more specific information is offered on the natural or experimental occurrence of the disease and the taxonomic position of the host species." It also mentions that geographical and host ranges are taken from: "World Animal Health Annual Reports (1994-2012) for all WOAHA member countries", "the 4th (2003) and the 5th (2006) editions of the WOAHA Manual of Diagnostic Tests for Aquatic Animals (the 2012 6th edition is currently being added)", "WOAHA's online 'Disease Information' weekly bulletins", and "Quarterly Aquatic Animal Disease Report (Asian & Pacific Region) 2003 - 2012". A note states that other information about geographical and host ranges from scientific literature is included as "non-WOAHA data" to ensure completeness. A section titled "UPDATES" explains that a search of current scientific literature is carried out continuously, and new information is entered into the "non-WOAHA data" section on a monthly basis. It also notes that subsequent data from future WOAHA World Animal Health reports will be entered as soon as they become available each year. A bolded statement says: "The development and maintenance of this database is funded by the Department for Environment, Food and Rural Affairs (Defra). The database is publicly available through the WOAHA Collaborating Centre for Information on Aquatic Animal Diseases, which is based at Cefas' Weymouth laboratory." Finally, it provides a link: "For more information please [contact us](#)." At the bottom, there is a grid of 12 buttons for navigation: IDAAD, REFERENCES BY KEYWORD, REFERENCES BY AUTHOR, REFERENCES BY TITLE, LOCATIONS, SPECIES BY COMMON NAME, SPECIES BY LATIN NAME, ALPHABETIC LIST OF DISEASES, PREVIOUSLY LISTED DISEASES, OIE LISTED DISEASES, RECENT ADDITIONS, and VALIDITY OF DATA.



Table 1. Sources of electronic information and surveillance actions

Source	Address	Output	Actions
World Organisation for Animal Health (OIE)	http://www.oie.int	Alerting service Disease digest	Received as released Received weekly
FAS Program for Monitoring Emerging Diseases (ProMED)	http://www.promedmail.org	Alerting service	Received daily +
IntraFish (media service)	http://www.intrafish.com	Newsletter	Received daily
FS (media service)	http://www.fis.com	Newsletter	Received daily
Seafood Intelligence (media service)	http://www.seafoodintelligence.com	Newsletter	Received daily
International Collective in Support of Fish Workers (ICSF)	http://www.icsf.net	Newsletter (Samudra)	Received daily
AquaVetMed (veterinary association)	http://www.avma.org	Information service	Received as released
Scientific Forum on Fish and Fisheries (Fish-Sci)	http://segate.sunet.se/archives/fish-sci.html	List serve	Received daily +
The Fish Site	http://www.thefishsite.com	Website	Industry information including disease notification, checked weekly
Fishfolk	http://mailman.mit.edu/mailman/listinfo/fishfolk	List serve	Received daily +
Fishupdate	http://www.fishupdate.com	Information Service	Received daily
Bites (Food Safety information Service – formerly International Food Safety Network)	http://bites.ksu.edu	Alerting Service	Received daily
Centre for Emerging Issues (CEI)	http://www.aphis.usda.gov	Website	Emerging disease notices checked weekly
National Wildlife Health Centre	http://www.nwhc.usgs.gov	Website	Emerging diseases in wildlife checked weekly
Fisheries and Oceans – Canada	http://www.dfo-mpo.gc.ca/index-eng.htm	Website	News reports from waters in and around Canada – checked weekly
Alaska Dept. of Fish and Game	http://www.adfg.alaska.gov/index.cfm?adfg=home.main	Website	News reports from waters in and around Alaska – checked weekly
NOAA – National Marine Fisheries Service	http://www.nmfs.noaa.gov	Website	News reports from waters in and around USA – checked weekly
Canadian Aquaculture Industry Alliance	http://www.aquaculture.ca/index.php	Website	News reports from aquaculture industry in Canada – checked weekly
Federation of American Scientists – Infectious Animal and Zoonotic Disease Surveillance	http://www.fas.org/ahed/	Website	News reports from Scientific Community in USA – checked weekly
Science Daily – Fish News	http://www.sciencedaily.com/news/plants_animals/fish/	Website	News reports from Scientific Community – Worldwide – checked weekly

Transboundary and Emerging Diseases

Transboundary and Emerging Diseases

ORIGINAL ARTICLE

Monitoring Emerging Diseases of Fish and Shellfish Using Electronic Sources

M. A. Thrush, P. L. Dunn and E. J. Peeler

Centre for Environment, Fisheries and Aquaculture Science, Barrack Road, Weymouth, Dorset, UK

Keywords:

aquatic, emerging disease, database, fish, shellfish, surveillance

Correspondence:

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doi:10.1111/j.1865-1682.2011.01283.x

Summary

New and emerging fish and shellfish diseases represent an important constraint to the growth and sustainability of many aquaculture sectors and have also caused substantial economic and environmental impacts in wild stocks. This paper details the results of 8 years of a monitoring programme for emerging aquatic animal diseases reported around the world. The objectives were to track global occurrences and, more specifically, to identify and provide advanced warning of disease threats that may affect wild and farmed fish stocks in the UK. A range of electronic information sources, including Internet newsletters, alerting services and news agency releases, was systematically searched for reports of new diseases, new presentations of known pathogens and known diseases occurring in new geographic locations or new host species. A database was established to log the details of key findings, and 250 emerging disease

8 year dataset (2002–2010)



The Fleming Fund



M. A. Thrush et al.

Monitoring Emerging Fish & Shellfish Diseases

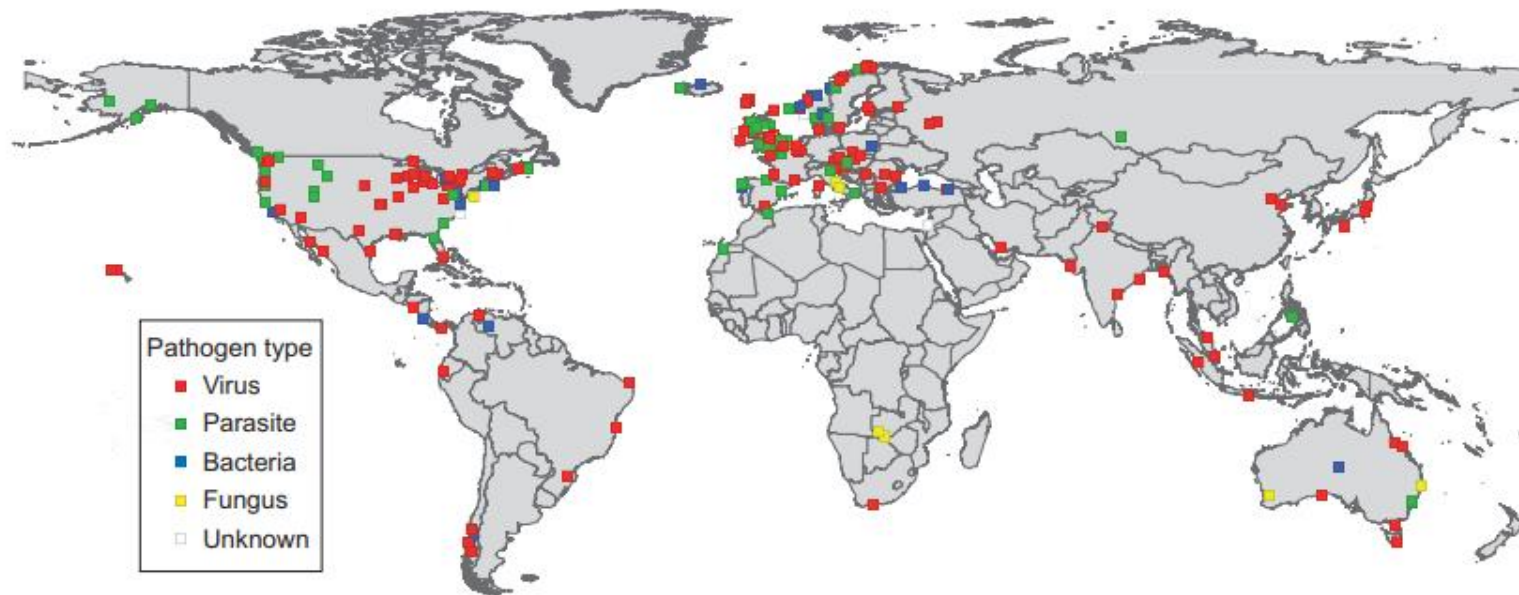


Fig. 1. World distribution of emerging disease events.

250 emerging disease events, 93 different pathogens in 52 countries

Europe and N. America; salmonids; viral diseases and known pathogen in new geographical location predominate

28% news agencies and info services; 25% OIE; 19% ProMED

IDAAD – monitoring electronic resources

- Collates some of the other information available that does not make it onto WAHIS
- Low level of emerging disease reporting to WOAHA
- Provides information to support risk analysis (of threat of new and emerging diseases) and decision making by CA around regulations, eg live animal movements,
- Long terms data provides information on
 - Trends
 - Geographic hotspots
 - Evidence for research into factors driving disease emergence

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A new approach to the management of emerging diseases of aquatic animals

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Summary

Since 1970, aquaculture has grown at a rate of between 5% and 10% per annum. It has achieved this by expanding into new areas, farming new (often non-native) species and intensifying production. These features of aquaculture, combined with large-scale movements of animals, have driven disease emergence, with negative consequences for both production and biodiversity. Efforts to improve the management of emerging diseases of aquatic animals must include actions to reduce the rate of disease emergence, enhance disease detection and reporting, and improve responses to prevent disease spread.

The rate of disease emergence can be reduced by understanding the underpinning mechanisms and developing measures to mitigate them. The three principal mechanisms of disease emergence, namely, host switching, decreased host immunocompetence and increased pathogen virulence, have many drivers. The

INTERNATIONAL DATABASE ON AQUATIC ANIMAL DISEASES

RECENT ADDITIONS

LATEST ABSTRACTS

1 month | 3 months | 6 months | Year

<p>ABSTRACT</p> <p>Georgia 12/07/23 — Infectious haematopoietic necrosis virus</p> <p>DOWNLOAD</p>	<p>ABSTRACT</p> <p>Romania - Gyrodactylus salaris (Inf. with)</p> <p>DOWNLOAD</p>	<p>ABSTRACT</p> <p>Exploring the eDNA dynamics of the host-pathogen pair <i>Pacifastacus leniusculus</i> (Decapoda) and <i>Aphanomyces astaci</i> (Saprolegniales) under experimental conditions</p> <p>DOWNLOAD</p>	<p>ABSTRACT</p> <p>Current status of infection with infectious hypodermal and hematopoietic necrosis virus (IHHNV) in the Peruvian and Ecuadorian shrimp industry</p> <p>DOWNLOAD</p>
<p>ABSTRACT</p> <p>Study of infectious hypodermal and hematopoietic necrosis virus (IHHNV) infection in different organs of <i>Penaeus vannamei</i></p> <p>DOWNLOAD</p>	<p>ABSTRACT</p> <p>Mozambique - <i>Aphanomyces invadans</i> (Inf. with) (Epizootic ulcerative syndrome) 17/07/2023</p> <p>DOWNLOAD</p>		

Includes peer reviewed publications

Aim -to improve website and functionality & include section on key new methods papers

IDAAD	REFERENCES BY KEYWORD	REFERENCES BY AUTHOR	REFERENCES BY TITLE
LOCATIONS	SPECIES BY COMMON NAME	SPECIES BY LATIN NAME	ALPHABETIC LIST OF DISEASES
PREVIOUSLY LISTED DISEASES	OIE LISTED DISEASES	RECENT ADDITIONS	VALIDITY OF DATA

Registry of Aquatic Pathology (RAP)

Whole Slide Imaging (WSI) and Digital Pathology

John Bignell

What is the Registry of Aquatic Pathology?

Collection of **aquatic animal diseases**.

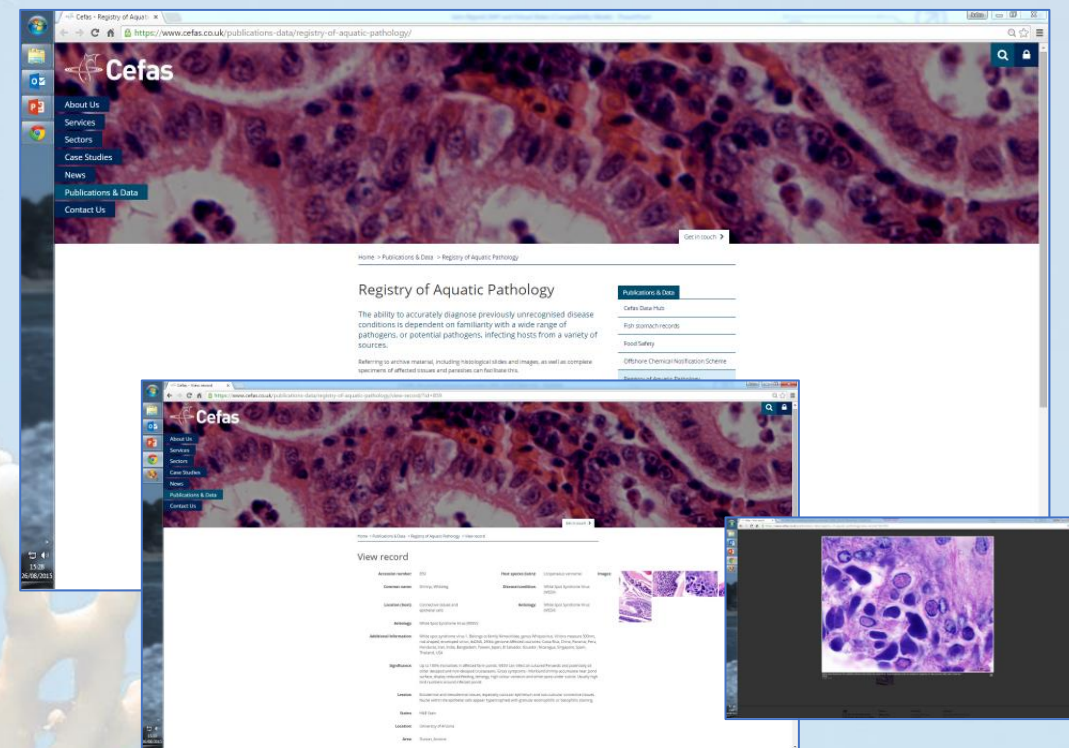
Includes **bacterial, parasitic** and **viral** disease.

Aquarium, cultured and wild fish and shellfish from **freshwater** and **marine** environments.

Materials include **microscope slides, gross pathology images** and **parasites**.

RAP is **online** on Cefas website <https://www.cefas.co.uk/data-and-publications/registry-of-aquatic-pathology/>

Now including digital imaging



What is Digital Pathology?

Whole slide imaging (WSI) is the **Google Earth™ of histopathology**.

WSI allows entire microscope slides to be **'scanned'** and stored digitally.

Scientists can access **'digital slides'** via internet and other digital storage media.

Requires specialist **hardware and software**.

Interrogated within an **internet browser** or proprietary software.*

Artificial intelligence (AI) and WSI is being used collectively for disease diagnosis e.g. cancer.



How are we using Digital Pathology?

A new platform for international collaboration

- Sharing with long distance collaborators
- Peer/Case review
- Remote diagnostics
- Training
- Registry of Aquatic Pathology (RAP)



Digital Pathology and WOAAH CC

Assistance in the investigation of new and emerging diseases internationally.

Histological skills may exist 'in-country'.

Histopathology skills may not exist due to worldwide shortage.

Digital slide scanners offer capability for countries to **engage with OIE CCEAAD pathologists directly**.

Cefas is currently undertaking pilot studies of this capability under existing partnerships and developing the scanned slide repository



Digital Pathology Demonstration